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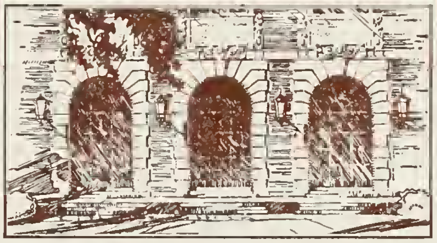

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AN ENERGY INPUT-OUTPUT MATRIX FOR THE UNITED STATES, 1963: USER'S GUIDE

By

Robert A. Herendeen

March 4, 1973

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Robert A. Herendeen

Center for Advanced Computation
University of Illinois at Urbana-Champaign
Urbana, Illinois, 61801

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This work was begun while the author was a staff member of the ORNL-NSF Environmental Program, Oak Ridge National Laboratory, Oak Ridge, Tennessee, 37830, and continued at the Center for Advanced Computation, University of Illinois, Urbana, Illinois, 61801. A more complete description is available (ref. 7).

ABSTRACT

Input-Output analysis offers a theoretical framework and large data base well suited to calculating the total (direct and indirect) energy cost of many classes of products (both goods and services). This paper discusses conversion of the 1963 Input-Output table[+] to energy terms at the 362 sector level. The methodology is described in detail, and potential sources of error are discussed. Several applications are presented: 1) detailed breakdown of the contributors of the total energy cost, 2) total energy efficiency of the energy-producing sectors, 3) energy required by agriculture, the food industry, and the energy cost of protein, 4) energy required by all transportation, and in particular, by the private automobile, 5) energy required by a small appliance, an electric mixer.

[+] Input-Output Structure of the U. S. Economy: 1963, U. S. Department of Commerce (1969)

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I. Introduction

Two thirds of America's energy goes to uses other than direct personal consumption (residential use and fuel for the private car). In discussing an individual's total energy requirements, one must therefore also pay attention to the indirect energy demand resulting from the demand for goods and services. In particular, one would like to know the energy impact of the manufacture/production/sales of the whole spectrum of consumer products.

This report lists results of this kind obtained using Input-Output analysis (I/O), a technique borrowed from economics. I/O is used for two reasons. First, there is a large body of data already available from the U. S. Department of Commerce(1), at a fairly high level of disaggregation (367-sector economy). Second, the conceptual(2) framework of I/O takes into account all steps in the complex manufacture-sales chain. The latter point is important: results obtained here indicate, for example, that the auto manufacturer itself uses only about 6% of the total energy necessary to produce and market a car.

The task of converting the existing I/O data, which are in terms of dollars, to energy, is non-trivial because energy is sold at different prices to different customers (e.g., a factor of six variation for electricity).

II. Input-Output Theory: determining energy "cost"

A. Dollar relationships

The data for I/O analysis is dollar sales per year between sectors of the economy. (367 sectors for 1963, the most recent compilation. 5 of these are energy sectors. Table 1 lists them). One then assumes linearity and time invariance:

$$X_i = \sum_{j=1}^{n} A_{ij} X_j + Y_i$$

X_i is the total output (dollars) of sector i

Y_i is the output (dollars) of i sold to final demand

A_{ij} are constants, obtained empirically from the data:

$A_{ij} = X_{ij}/X_j$, where X_{ij} = sales (dollars) from sector i to sector j.

The assumption of constant A_{ij} is that of technological constancy (measured in dollars). In matrix form,

$\underline{X} = \underline{\underline{A}}\ \underline{X} + \underline{Y}$, which is inverted to yield

$$\underline{X} = (\underline{\underline{I}} - \underline{\underline{A}})^{-1}\ \underline{Y} \tag{1}$$

Eq. (1) gives the total outputs as a function of the final demand, of which personal consumption expenditures are a part. One can now determine the outputs required to produce an arbitrary set of final demands, which is the whole intent of this approach. $(\underline{\underline{I}} - \underline{\underline{A}})^{-1}$ has been published at the 367 level for 1963(1).

B. Introducing Energy(3)

To convert to energy terms, let

$E_i = \sum_{k=1}^{n} E_{ik} + E_{iy}$, where

E_i = total energy output (Btu) of energy sector i

E_{ik} = energy sales (Btu) from i to k

E_{iy} = energy (Btu) of type i sold to final demand

Since $E_{ik} = \left(\frac{E_{ik}}{X_k}\right) X_k = \frac{E_{ik}}{X_k} \sum_{m=1}^{n} (I - A)^{-1}_{km} Y_m$,

$$E_i = \sum_{k=1}^{n} \sum_{m=1}^{n} \left(\frac{E_{ik}}{X_k}\right) (1 - A)^{-1}_{km} Y_m + \left(\frac{E_{iy}}{Y_i}\right) Y_i$$

Define: a) $R_{ik} = E_{ik}/X_k$

$$\text{b) } S_{ik} \begin{cases} E_{iy}/Y_i, & i = k = \text{energy sector} \\ 0, & \text{otherwise} \end{cases}$$

Then

$$\underline{E} = [\underline{\underline{R}} \; (\underline{\underline{I}} - \underline{\underline{A}})^{-1} + \underline{\underline{S}}] \; \underline{Y} \tag{2}$$

The term in brackets is called $\underline{\underline{\epsilon}}$, the total energy matrix. It is 5 x 362[+], and ϵ_{ij} gives the total output (Btu) of energy sector i required for the economy to deliver a dollar's worth of project j to final demand.[*] It should be noted that in constructing $\underline{\underline{R}}$, one is constrained to choose the energy flows appropriate to the time period and sector definitions used in constructing $\underline{\underline{A}}$. $\underline{\underline{R}}$ and $\underline{\underline{A}}$ are not independent in a real economic system.

[+] Several sectors use no energy and are deleted.

[*] Hereafter referred to as \$1 FD(j)

As an example, consider the 3 sector economy whose sales for a year are thus:

	Crude Oil	Refined Petroleum	Cars	Final Demand	Total Output
Crude Oil	0	10 (40)	0	0	10
Refined Petroleum	5 (5)	5 (5)	5 (5)	25 (25)	40 (40)
Cars	0	0	0	20	20

Figures in parenthesis are energy sales; the others are dollar sales.

$$\underline{\underline{A}} = \begin{pmatrix} 0 & 1/4 & 0 \\ 1/2 & 1/8 & 1/4 \\ 0 & 0 & 0 \end{pmatrix} \quad ; \quad (\underline{\underline{I}} - \underline{\underline{A}})^{-1} = \begin{pmatrix} 7/6 & 1/3 & 1/12 \\ 2/3 & 4/3 & 1/3 \\ 0 & 0 & 1 \end{pmatrix}$$

$$\underline{\underline{R}} = \begin{pmatrix} 0 & 1 & 0 \\ 1/2 & 1/8 & 1/4 \end{pmatrix} \quad ; \quad \underline{\underline{\epsilon}} = \left[\begin{pmatrix} 2/3 & 4/3 & 1/3 \\ 2/3 & 1/3 & 1/3 \end{pmatrix} + \begin{pmatrix} 0 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}\right]$$

Additional information can be obtained from this approach. For example, how much energy is used to make the (say) steel contained in a car? This can be obtained from individual terms in the matrix product $\underline{\underline{R}}\,(\underline{\underline{I}} - \underline{\underline{A}})^{-1}$. $R_{ik}\,(\underline{\underline{I}} - \underline{\underline{A}})^{-1}_{kj}$ is the energy type i supplied to k in order for k to supply enough of its output for the economy to deliver \$1 FD (j).

For example, writing eq. (2) in terms of uncollapsed sums yields

$$\underline{\underline{\epsilon}} = \begin{pmatrix} (7/12 \overset{2/3}{+} 1/12) & (1/6 \overset{4/3}{+} 1/6) & (1/24 + \overset{1/3}{1/24} + 1/4) \end{pmatrix} + \begin{pmatrix} 0 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$$

Thus, of the total of 1/3 Btu of refined petroleum required to deliver \$1 FD (car), 1/24 Btu is used by crude, 1/24 Btu by the refined petroleum sector itself, and 1/4 Btu by cars. Table 5 shows an application of this technique.

C. A Problem with Primary Energy Sectors

The approach outlined so far does not assure that the amount of refined petroleum required per \$1 FD (j) will not exceed the amount of crude. In fact, it is possible to construct an economy which does this, and yet is monetarily and energetically realistic. The problem is one of allocation - the present method doesn't use the refined petroleum pricing data (there is a price implied in R_{ij}) to allocate crude; it merely uses the dollar flows. Explicit treatment is needed.

The method I suggest transfers the crude sold to refineries to the refineries (or in general, from primary to consuming secondary industry), "letting" the refined sector distribute it, and then allocates this use back to crude. In the example, this requires letting $R_{crude \to ref} = 0$ to produce a new $\underline{\underline{R}}$ (r) (reduced) and a new $\underline{\underline{\epsilon}}$ (r):

$$\underline{\underline{\epsilon}}\ (r) = [\underline{\underline{R}}\ (r) \quad (\underline{\underline{I}} - \underline{\underline{A}})^{-1} + \underline{\underline{S}}]$$

The new total energy coefficient (called $\underline{\underline{T}}$) has a new crude row:

$$T_{crude \to j} = \epsilon_{crude \to j}\ (r) + \left(\frac{E_{crude \to ref}}{E_{ref}}\right) \epsilon_{ref \to j}\ (r)$$

To demonstrate, change the refined petroleum Btu sales in the example to 5, 5, 10, 20 Btu. (Note that this implies new prices: a new economy). Without the correction,

$$\epsilon = \begin{pmatrix} 2/3 & 4/3 & 1/3 \\ 2/3 & 1/3 & 7/12 \end{pmatrix} + \begin{pmatrix} 0 & 0 & 0 \\ 0 & 4/5 & 0 \end{pmatrix}$$

which shows that cars require more refined than crude!

But

$$\epsilon(r) = \begin{pmatrix} 0 & 0 & 0 \\ 2/3 & 1/3 & 7/12 \end{pmatrix} + \begin{pmatrix} 0 & 0 & 0 \\ 0 & 4/5 & 0 \end{pmatrix}$$

and, since $\dfrac{E_{crude-ref}}{E_{ref}} = 1$,

$$\underline{\underline{T}} = \begin{pmatrix} 2/3 & 1/3 & 7/12 \\ 2/3 & 1/3 & 7/12 \end{pmatrix} + \begin{pmatrix} 0 & 4/5 & 0 \\ 0 & 4/5 & 0 \end{pmatrix}$$

Energy is now "conserved", and now some crude is allocated to final demand.

In the Department of Commerce I/O matrix, there are five energy sectors:

Index	I/O Sector	Title
1	7.00	Coal mining
2	8.00	Oil and gas wells
3	31.01	Refined petroleum
4	68.01	Electric utilities
5	68.02	Gas utilities

$\underline{\underline{\epsilon}}(r)$ is obtained with the following energy flows set equal to 0:

1 → 4 , coal → electrical utilities

2 → 3 , crude oil and gas → refined petroleum

2 → 5 , crude oil and gas → gas utilities

3 → 4 , refined petroleum → electric utilities

5 → 4 , gas utilities → electric utilities

By the same reasoning as above*

$$T_{ij} = \sum_k C_{ik}\, \epsilon_{kj}(r) \text{ , or } \underline{\underline{T}} = \underline{\underline{C}}\, [\underline{\underline{R}}(r)\, (\underline{\underline{I}} - \underline{\underline{A}})^{-1} + \underline{\underline{S}}] \tag{3}$$

where

$C_{ii} = 1, i = 1, 2 . . . 5$

$C_{14} = E_{14}/E_4$

$C_{23} = E_{23}/E_3$

$C_{24} = (E_{23}/E_3)\ (E_{34}/E_4)\ +\ (E_{25}/E_5)\ (E_{54})$

$C_{25} = E_{25}/E_5$

---

* This is still an approximation, as I have not accounted for electricity used by refineries, etc. These energy flows are small compared with those included in Eq. (3).

$C_{34} = E_{34}/E_4$

$C_{54} = E_{54}/E_4$

The matrix $\underline{\underline{C}}$ is given in Table 4.

D. Limitations of the I/O Approach

Some of these result from data handling problems, but several are conceptual. These derive mostly from economic conventions used in constructing the published I/O tables.

1. I/O data is subject to inaccuracies from 1) lack of complete coverage of an industry, 2) restriction of information for proprietary reasons, 3) use of different time periods for different kinds of data. Errors in $\underline{\underline{A}}$ may generate disproportionate errors in $(\underline{\underline{I}} - \underline{\underline{A}})^{-1}$. We are actively pursuing this last point. Preliminary analysis shows the published $(I - A)^{-1}$ to have a condition number of 5; this is an upper limit of the multiplication of error.

2. The use of dollars rather than physical units to express physical dependencies is risky. For example, aggregation can combine two processes whose energy intensities differ widely in the same sector. And, dollar economies of scale may be implicit in the A_{ij}, whereas there would be no (or little) corresponding effect in physical terms.

3. There is the problem of transfers. BEA's I/O sector definition is based on the establishment rather than activity. For example, if those establishments which produce primary aluminum also produce aluminum castings (amounting to less than 50% of total sales), the primary aluminum sector is credited with their complete output. The secondary output is transferred to the aluminum castings sector, i.e., treated as a sale. The corresponding inputs are not transferred. This means that the dollar output corresponding to production of these aluminum castings has been counted twice, but the energy only once. The fraction transferred varies from sector to sector, so that R_{ij} require a

correction. Details are in the Appendix.

4. A problem arises in capital goods; these are not considered part of the interindustry transactions but are listed as sales to final demand. Conceptually, I would consider the energy to make a steel forming press owned by an auto manufacturer to be as valid an energy contribution to my car as that used to make the steel, but this is not the convention used in I/O. One must learn in detail how this is handled, since capital is defined differently from industry to industry, and sways with the winds of the tax laws. Given reliable figures, one can separate the capital for depreciation from that for expansion, and allocate it (as its energy input) to the actual consuming sector. We are actively studying this question.

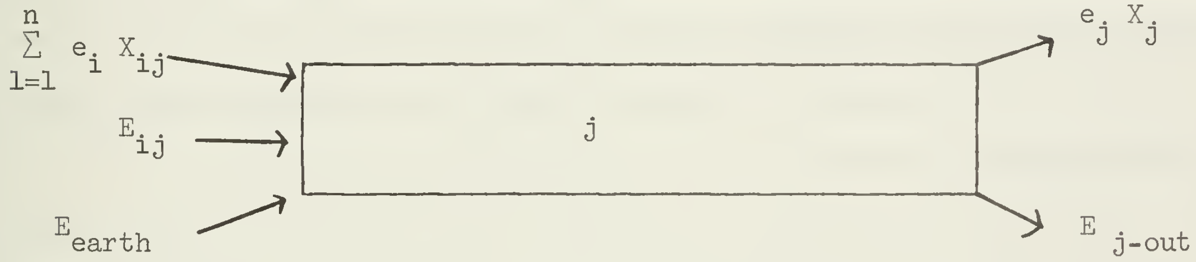
5. Final demand is measured in producer's, not purchaser's prices. Since the I/O sectors include wholesale and retail trade, it is possible to make the conversion, including the energy requirements implied in the markup (as has been done for the automobile in Section V). But for direct use by consumers, it is desirable to convert beforehand to producer's prices. Data on markups are available from the Department of Commerce, and we are now using them.

6. Input-Output coefficients change with time, yet we hope to use the results to predict the consequences of hypothetical consumption patterns. Can one quantify their loss or reliability with time? This is a major point, for which much work is needed. We shall be converting the 1967 I/O table to energy terms for comparison with 1963, and we are starting sensitivity analyses to determine which coefficients are most critical. Our feeling is that energy use coefficients, on the whole, change faster than others.

E. Semantics: What is the energy needed to make a product or provide a service?

The total energy coefficients T_{ij} allows an answer when the question is modified to read "supply a product to final demand." One can allocate all of the U. S. energy budget this way (i.e., $\underline{E} = \underline{\underline{T}}\,\underline{Y}$). But this scheme gives absurdly low weight to sectors which sell little of their output to final demand (e.g., primary metals). Trying to assign an energy to this kind of sector is difficult. An additional ton of aluminum can be required as a result of many different changes in final demand (e.g., for more milk!), and each will have a different energy requirement; there is no unambiguous energy impact of the additional aluminum production. The argument below helps to resolve this.(4)

Let a sector receive 1) direct energy from energy sectors or the "earth" (if an energy sector), 2) embodied energy by virtue of purchases of processed inputs, and let it distribute 1) actual energy (if an energy sector) and 2) embodied energy in its sales.



Here we will assume only one energy sector, but generalization is easy. For the energy sector m, $E_{earth-m} = E_{m-out}$; these quantities are zero for the other sectors. $E_{ij} = 0$ unless $i = m$. The model assumes that embodied energy content per dollar, e_j , is the same for all sales by j, and does not differentiate sales to final demand. Energy balance requires

$$e_j X_j - \sum_{i=1}^{n} e_i X_{ij} = E_{ij} + E_{earth} - E_{j\text{-out}}$$

The right hand side is the energy dissipated in j; call it η_j

$$e_j - \sum_{i=1}^{n} e_i \frac{X_{ij}}{X_j} = e_j - \sum_{i=1}^{n} e_i A_{ij} = \frac{\eta_i}{X_j} = R_j$$

$$\underline{e} = \underline{R}\,(\underline{\underline{I}} - \underline{\underline{A}})^{-1}$$

The embodied energy coefficient is thus identical to the total energy coefficient obtained before, but now it is associated with all sales of j, not just those to final demand. If we used total outputs to allocate energy, we'd obtain a total energy several times greater than the U. S. energy use, since there is much double counting. One obtains this picture of the economy: Energy enters through the primary sectors, a greater quantity of embodied energy circulates, and an amount equal to the input leaves via final demand.

It is possible to allocate on the basis of total output, but then a disclaimer is needed: "The energy necessary to supply the production of widgets last year is given by the total output times the total energy coefficient. Many of these widgets would not have been produced were there not also production of gizmos which require widgets as inputs. The energy needed to produce gizmos thus includes that to produce the required widgets, and allocating energy this way double counts."

III. Allocating energies

The main task of this work has been the determination of the energies used by the various sectors for the construction of the matrices $\underline{\underline{R}}$ and $\underline{\underline{S}}$ (Section II B).

Data on energy supplied to industry(5) (I/O sectors 13.01-64.12) and mining(6) (sectors 5.00-10.00) are tabulated at 5 year intervals (more often at a lower level of disaggregation) by the Bureau of the Census. (Refined petroleum products are not well covered, however.) Their data are easily converted to the I/O format; hence, they are a prime source. They cover about 300 of the 362 sectors, accounting for over half of the non-residential energy use in 1963. The Census of Manufactures includes the use of fuel materials for non-fuel purposes, such as coal for coke in steel making, and petrochemical feedstocks.

The remaining 60-odd sectors, including agriculture, construction, transportation other than private car, service industries, communication--the commercial sectors--are generally not as well documented. Detailed data are available for only a few, notably transportation. Most must be treated by approximations and ad hoc proration schemes.

Ref. 7 contains the details of my attempts to allocate energies for 1963. The final result is the detailed energy data in Table 2.

IV. Results

Results for conversion of the 1963 I/O table to energy terms are presented in Tables 2 and 3. Before discussing them, let me again caution about the limitations to their use. Besides these mentioned in Section II there are two others: first, nuances from my personal approach to computation (e.g., the primary/secondary energy breakdown in Section II C or the treatment of hydropower below); and second, the conceptual difficulties inherent in trying to withdraw physical data from a table built on economist's definitions and conventions. These are extremely important, and reference must be made to the literature of I/O(2), and that supplementary to the published I/O table(1). Some of these problems are illustrated in Section V.

A. Energy allocations

Table 2 lists the energies as supplied to the consuming sectors in 1963. The five rows are the I/O sectors (with the decimal point omitted) for coal, crude oil and gas extraction, refined petroleum, electric utilities, and gas utilities. The columns correspond to the 362 sectors of the economy; see Table 1. The data result from the detailed energy allocation in ref. 7 and have been corrected for transfers per the Appendix. Units are Btu. Five entries are listed in parentheses; they are for sales from primary to secondary energy sectors, and receive special treatment in computation as explained in Section II C.

B. Energy coefficients

Table 3 lists the total energy coefficients and auxilliary results. Interpretation is complicated by the fact that the computer printout terminology is not the same as the notation of Section II, to which the reader should refer. Section IVB 1) defines and explains the terms, while Section IVB 2) illustrates them for a specific sector, refined petroleum.

1. Explanation for interpreting Table 3. Recall from Section II that

$$\underline{E} = \underline{\underline{T}}\ \underline{Y}, \text{ where } \underline{\underline{T}} = \underline{\underline{C}}\ [\underline{\underline{R}}(r)\ (\underline{\underline{I}} - \underline{\underline{A}})^{-1} + \underline{\underline{S}}]$$

a. $(\text{DIRBTU})_{ij}$ is identically equal to R_{ij}, i.e., the energy of type i supplied to sector j per dollar of j's output. The units are 10^6 Btu/\$(1963). Figures in parenthesis represent energy flows from primary to secondary sectors which are explicitly treated in Section IIC. Values shown have been corrected for transfers; see the Appendix.

b. $(\text{INVBTU})_{ij} = [\underline{\underline{C}}\ \underline{\underline{R}}(r)\ (\underline{\underline{I}} - \underline{\underline{A}})^{-1}]_{ij}$. This is the energy of type i supplied to all sectors (except final demand) per \$1 TFD (j). If j is an energy sector, one must also take account of the energy delivered directly to final demand as well by

$$T_{ij} = (\text{INVBTU})_{ij} + (\underline{\underline{C}}\ \underline{\underline{S}})_{ij}$$

I have purposely kept this last term separate; it is listed in Table 4. Units for both Tables 3 and 4 are 10^6 Btu/\$(1963). The interpretation when j is an energy sector is that the second term is the actual energy delivered to final demand, and the first term is the energy consumed in the economy per \$1 TFD (j).

c. $(\text{TOINBP})_j$ is the total primary energy required per \$1 TFD (j). The units are 10^6 Btu/\$(1963). It is obtained by summing the coal and crude oil and gas required per \$1 TFD (j), plus a fossil fuel equivalent for hydro- and nuclear power (which produced 18.1% and 0.3% of America's electricity, respectively, in 1963). This follows the usual convention of converting of the current efficiency of fossil fuel electric plants. The final expression is then

$$(\mathrm{TOINBP})_j = (\mathrm{INVBTU})_{1j} + (\mathrm{INVBTU})_{2j} + 0.5948\ (\mathrm{INVBTU})_{4j}^{*}.$$

Again, for j = energy sector, one must refer also to Table 6 for the energy delivered directly to final demand.

d. $(\mathrm{TOINBU})_j = (\mathrm{INVBTU})_{1j} + (\mathrm{INVBTU})_{2j} - 1.636\ (\mathrm{INVBTU})_{4j}$.

This is the total primary energy minus that rejected in fossil fuel electric plants. Units are 10^6 Btu/\$(1963).

Roughly speaking, this is the energy that would be required if the economy could substitute other energies for electricity. Again, for j = energy sector, an additional term for Table 4 is needed.

e. The entries in Table 3 after (TOINBU) are actually applications of the use of the coefficients for 1963. For example, $(\mathrm{PCGDOB})_{ij}$ is the fraction of the U. S. total output of energy i that was required to satisfy the 1963 total final demand for j. (See sections i), j), k) below). Thus

$$(\mathrm{PCGDOB})_{ij} = (\mathrm{INVBTU})_{ij}\ (\mathrm{TFDDOL})_j/(\mathrm{GDOBTU})_i$$

Again, an additional term from Table 4 would be needed if j = energy sector.

---

*Details of the calculation: From Table 2, 5490 x 10^{12} Btu (coal), 543 x 10^{12} Btu (refined petroleum), and 2220 x 10^{12} Btu (gas) were burned in power plants. 3.128 x 10^{15} Btu (916.8 x 10^9 KW hr. x 3413 Btu/KW hr.) of electricity was produced, but 18.4% was hydro or nuclear. Thus, the fossil fuel heat rate was $(8.253 \times 10^{15})/((916.8 \times 10^9)\ (1 - .184))$= 11032 Btu/KW hr., or 3.2323 Btu/Btu. Since 18.4% of electricity was from hydro or nuclear, the fossil fuel factor is (3.2323) (.184) = 0.5948 Btu/Btu. EEI's figure for fossil plants in 1963 is 10,438 Btu/KW hr.(8) The discrepancy with my value of 11,032 is probably due to my assumed heat value for coal burned in power plants. I used an average value for all coal used in the U. S. My main source of conversion factors is ref. 3.

f. $(\mathrm{TOPCGP})_j$ is the fraction of the total primary energy necessitated by 1963's final demand for j; as in Section IVB 1) c) it requires a sum over coal, crude and gas, and hydro- and nuclear power. Thus

$$(\mathrm{TOPCGP})_j = \frac{\sum_{i=1}^{2} (\mathrm{PCGDOB})_{ij}\ (\mathrm{GDOBTU})_i + 0.5948\ (\mathrm{PCGDOB})_{4j}\ (\mathrm{GDOBTU})_4}{\sum_{i=1}^{2} (\mathrm{GDOBTU})_i + 0.5948\ (\mathrm{GDOBTU})_4}$$

Again, if j = energy sector, an additional term from Table 4 would be needed.

g. $(\mathrm{TOTPCU})_j$ is defined analogously; it is the total primary energy minus the energy rejected in power plants. Its expression is the same as for $(\mathrm{TOPCGP})_j$, except that 0.5948 is replaced with -1.636. Again, if j = energy sector, an additional term from Table 4 is needed.

h. $(\mathrm{PCGTOT})_i$ is a control total that allows a check of the Input-Output approach. One would like to know if the product of the total energy coefficients and the U. S. final demands for 1963 really gives the total energy consumed; i.e., does energy in = energy out for our model? Thus

$$(\mathrm{PCGTOT})_i = \frac{\sum_{j} (\mathrm{INVBTU})_{ij}\ (\mathrm{TFDDOL})_j}{(\mathrm{GDOBTU})_i}$$

is the fraction of the total U. S. budget of energy i that was consumed in all sectors except final demand to satisfy 1963's final demands. These results are printed on the first page of Table 3, and they all are less than one because of the energy sold to final demand. Using Table 4, we can add this latter energy:

Sector (i)	$(\mathrm{PCGTOT})_i$	$(\underline{\underline{C}}\ \underline{\underline{S}}\ \underline{Y})_i/(\mathrm{GDOBTU})_i$	$(\mathrm{SUM})_i$
7.00	0.6847	0.3129	0.9976
8.00	0.5806	0.4170	0.9976
31.01	0.5047	0.4917	0.9964
68.01	0.6738	0.3241	0.9979
68.02	0.6605	0.3391	0.9996

The sum in the last column should equal unity for a perfect energy balance. The agreement is to within 0.4% for all sectors, which I consider good.

i. $(GDOBTU)_i$ = total energy output of energy sector i. Units are 10^9 Btu. This was called E_i in Section II.

j. $(GDODOL)_j$ = total output of sector j. Units are $\$10^3$ (1963). This was called X_j in Section II.

k. $(TFDDOL)_j$ = total final demand of sector j. Units are $\$10^3$ (1963). This was called Y_j in Section II.

2. Example: use of Tables 3 and 4 for I/O sector 31.01, refined petroleum. I have purposely chosen an energy sector, which is more complex than a non-energy sector. The subsection headings below correspond to those in Section IVB 1), in the same order.

a. Sector 31.01 received 9.12×10^2 Btu of coal, 2.018×10^6 Btu of crude, 6.89×10^4 Btu of refined petroleum, 1.78×10^3 Btu of electricity, and 3.45×10^4 Btu of gas per dollar of its output.

b. \$1 TFD (31.01) required 1.37×10^4 Btu of coal, 1.80×10^5 Btu of crude, etc., to be "supplied" to all sectors except final demand. In addition, from Table 4 the dollar's worth of petroleum delivered to final demand had an energy content of 1.060×10^6 Btu, and this implies an allocation of 0.9498×10^6 Btu of crude to final demand. The crude is less than the refined because of the import of refined, which is not accounted for in Table 4[*].

c. 1.967×10^5 Btu plus 9.498×10^5 Btu of primary energy was required to provide \$1 TFD (31.01). The first term is from Table 3 (i.e., $(TOINBP)_{31.01}$); and the second, from Table 4, is the crude allocated to final demand corresponding to the sale of refined petroleum.

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[*] Imports complicate the meaning of primary energy, since the technology that produced imported refined petroleum lies outside the U. S., and is not included in the I/O Table.

d. When corrected for the losses in electric power generation, the first term in c) becomes 1.887×10^5 Btu. The second is unchanged.

e. In order for the economy to deliver 1963's final demand of refined petroleum ($\$10.09 \times 10^9$), the five energy sectors were required to supply 1.11, 5.30, 3.93, 1.56, and 4.87%, respectively, of this total energy output to the sectors other than final demand. (These figures are read directly from Table 3). The final demand term adds energy to the crude and refined sectors, so that the figures for these become 33.3 and 52.3%, respectively. These must be calculated from results in Tables 3 and 4. E.g., for refined petroleum, the total energy demanded is

$$[(\text{INVBTU})_{31.01,\ 31.01} + (\underline{\underline{\text{CS}}})_{31.01,\ 31.01}]\ (\text{TFDDOL})_{31.01}$$

$$= (8.605 \times 10^4 + 1.060 \times 10^6)\ \frac{\text{Btu}}{\$}\ (\$1.009 \times 10^{10})$$

$= 11.56 \times 10^{15}$ Btu, which is 52.3% of the total refined petroleum energy output, 22.1×10^{15} Btu.

f. The 1963 final demand for refined petroleum required 4.03% of the nation's primary energy to be supplied to the sectors other than final demand. (TOINBP, from Table 3). When the final demand energy is accounted for, the figure becomes 23.82%. This is calculated from Tables 3 and 4 by primary energy required =

$$((\text{TOINBP})_{31.01} + (\underline{\underline{\text{CS}}})_{8.00,\ 31.01})\ \ (\text{TFDDOL})_{31.01}$$

$$= (1.967 \times 10^5 + 9.498 \times 10^5)\ \frac{\text{Btu}}{\$}\ (\$1.009 \times 10^{10})$$

$= 11.57 \times 10^{15}$ Btu. The total primary energy of the U. S. (defined consistently with the discussion in Section IVB 1) c)), is $12.48 \times 10^{15} + 34.23 \times 10^{15} + (0.5948)\ (3.128 \times 10^{15})$ $= 48.57 \times 10^{15}$ Btu (The (GDOBTU)'s are from Table 3 also).

$11.57/48.57 = 23.82\%$.

C. Breakdown of total energy requirements by intermediate sector.

Table 5 illustrates a breakdown of total energy requirements by intermediate sector, as discussed in Section II B. Of the total energy of type i required by $1 TFD (j), some fraction was supplied to intermediate sector s. $(\text{PCINVB})_{isj}$ gives that fraction.

For simplicity I have aggregated the 362 sectors into 28, as tabulated in Table 6. I have omitted some sectors, so the column totals are less than 1. Three sectors are shown: Apparel made from purchased materials (18.04), household refrigerators and freezers (54.02), and motor vehicles and parts (59.03). Others are available on request.

V. Example applications

As described, the basic idea is to use the energy coefficients of Tables 3 and 4 to convert from appropriate dollar expenditures to energy. Several applications follow, and it is hoped that many more will be developed.

A. Energy efficiency of the energy supply sectors.

This is the inverse of the total primary energy required to supply 1 Btu of energy of type i to final demand. It is given by

$$\left\{\left[(\mathrm{TOINBP})_i + (\underline{\underline{C}}\;\underline{\underline{S}})_{1i} + (\underline{\underline{C}}\;\underline{\underline{S}})_{2i} + 0.5948\,(\underline{\underline{C}}\;\underline{\underline{S}})_{4i}\right] \Big/ (\underline{\underline{C}}\;\underline{\underline{S}})_{jj}.\right\}^{-1}$$

From Tables 3 and 4, this is

$$\left[\frac{0.1967 + 0.9498}{1.060}\right]^{-1} = (1.082)^{-1} \text{ Btu/Btu}$$

Thus 1.082 Btu of domestic primary energy was required to allow 1 Btu of refined petroleum to go to final demand in 1963. However, in that year 10.4% of refined petroleum was imported, so the efficiency of the American economy in producing refined petroleum must be adjusted: $\left[\frac{1.082}{.896}\right] = \left[1.208\right]^{-1}$. Similar results for the other sectors are listed in Table 7.

B. Agriculture and food.

1. Agriculture.

Ten sectors (1.01 - .03, 2.01 - .07) are identified as agricultural, and the energy to support their production is obtained by summing the total primary energy (TOINBP) needed to produce each sector's output minus that sold to other agricultural sectors, i.e.,

$$\sum_{i \in G} (\text{TOINBP})_i \; (X_i - \sum_{j \in G} X_{ij})$$

where G is the set of agricultural sectors. Little of the output of these sectors goes to final demand; refer to Section II E. For 1963, the energy was 2.2×10^{15} Btu, which is 4.4% of the U. S. energy budget. For comparison, one may obtain the direct energy use by these sectors from Table 2; when these are converted to primary energy using Table 7, one finds a direct energy use of 1.16×10^{15} Btu. Agriculture thus required about as much energy indirectly to produce its non-energy inputs such as equipment, fertilizer, etc., as it did for direct use.

2. Food and kindred products.

The same analysis can be applied to the food sectors (I/O 14.01-.32) to yield 3.6×10^{15} Btu, which is 7.2% of the energy budget in 1963. Of course, much of the agriculture energy has been counted again here, since the food processing industry is agriculture's biggest customer. The total figure can be compared with the calorie content of the food, about 0.8×10^{15} Btu(9). The embodied energy is thus 4 1/2 times the food energy.

3. The energy cost of protein.

Several I/O sectors cover high protein foods, and the energy cost of the final processed, packaged product can be calculated in terms of the protein content. In this case, this is a final demand expenditure. Table 8 lists results for four sectors: meat products, cheese, milk, and fish. It seems that in 1963, fish was a relatively low-energy source of protein, and milk a high one. In comparing these figures, recall that this is the total direct and indirect energy.

C. Transportation

The direct fuel use for all transportation is about one-quarter of America's energy, but much indirect energy is required as well.

1. The automobile, 1963(10)

Table 9 applies the method of Section II to the private automobile. All associated expenditures are part of final demand. The average new domestic auto in 1963 was worth $1890 in producers' prices, which implies a total production energy cost of 132×10^6 Btu, which agrees remarkably well with the figure obtain by Berry and Fels.(11)

The final demand expenditures associated with the auto were 12.4% of the GNP, but accounted for 20.5% of the nation's energy budget. Only 57% of the auto's energy was for direct use as fuel.

2. All transportation, 1963

This is partly a definitional problem. 23 sectors would be called transportation sectors: highway construction, motor vehicles + eqt., aircraft + parts, other transportation eqt., transportation + warehousing and auto repair + services. As described in ref. 10, other categories apply some of their final demand expenses to support the auto (e.g., insurance). In addition, the refined petroleum sector fuels almost all transportation. Then an estimate for transportation's total energy is

$$\sum_{i\in H} (\mathrm{TOINBP})'_i \, (X_i - \sum_{i\in H} X_{ij}) + \sum_{j\in H'} (\mathrm{TOINBP})'_i \, Y'_j + E_F \, .$$

$(\mathrm{TOINBP})'_i$ is the total primary energy coefficient diminished by the refined petroleum used by industrial transportation, H is the set of 23 transportation sectors, and H' is the set of sectors which partly support the private car. E_F= direct fuel used by transportation, and that burned in the society to produce that fuel (from Table 7, this is roughly an additional 20%).

Table 10 lists the results. In 1963, transportation's direct fuel use was 23% of the U. S. use, but the total energy impact amounted to 42%. This is probably a lower bound, as undoubtedly many transportation-associated activities have been neglected (such as industrial construction for parking, which is a capital expense). I would estimate it as high as 45%.

D. Appliance use: an electric mixer.

This simple application is meant to suggest others in terms of consumer choices. A typical electric mixer uses about 100 watts and is operated (say) 15 minutes a week; during the year it consumes 1.3 KW hr. of electric energy.* From Table 12, this requires $1.3 \times \frac{1}{.258} \times 3413 = 17,200$ Btu of primary energy. In 1963, an average mixer cost \$20 (purchaser's price).(15) Ideally, we should break this down into producer's price and markup and apply the appropriate I/O coefficients. For simplicity, I'll assume that the markup was 40% of purchaser's price and that all of it is allocable to retail trade (I/O sector 69.02). Electric mixers belong in sector 54.04, electric housewares and fans. Then the capital energy cost is given by

$$[0.6\ (\mathrm{TOINBP})_{54.04} + 0.4\ (\mathrm{TOINBP})_{69.02}]\ \frac{\mathrm{Btu}}{\$}\ (\$20)$$

$$= [0.6\ (74,100) + 0.4\ (32,700)]\ \ (20)$$

$$= 1.15 \times 10^6\ \mathrm{Btu}$$

Assuming that the device is maintenance-and repair-free till its demise, 15 years hence, and that its disposal is energy free, the yearly average capital energy cost is one-fifteenth of this, or 76,700 Btu. Thus, the mixer requires 76,700 + 17,200 = 93,900 Btu/year, of which only 18% is operating energy.

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*Since I estimated the usage rate, the figures here are not final; they are presented only to illustrate the approach.

Appendix: Correcting for transfers

Because BEA's I/O table is based on the establishment, part of the output of many sectors is counted as the output of another. However, the corresponding inputs are not transferred(1). For most of the industrial sectors, I obtained energy data from the Census of Manufacturers; BEA obtained their initial dollar data from the same source. I used the energy inputs as published, but BEA further manipulated the dollar flows with transfers, at least partially double counting. As a result, the inverse prices would tend to be incorrect; some greater than, some less than, their "correct" values.

To compensate for this fully, one would have to know the exact amount of energy used in manufacturing secondary products (e.g., aluminum castings produced at a primary aluminum smelter). This is practically impossible; so I'll use the following proration scheme:

The actual "in-house" output of sector j is $X_j - \sum_k t_{kj}$, where the sum is over all transfers into j. This suggests that the correct energy of type i to associate with the output of j (including transfers) should be

$$E_{ij} = E_{ij}\, g_j / \langle g_j \rangle_i$$

$$\text{where } g_j = \left[1 - \sum_k t_{kj} \Big/ X_j \right]^{-1}.$$

g_j can be calculated from data in the I/O table(1), and $\langle g_j \rangle_i$ is the computed average value of g_j such that the total amount of energy type i used by all of the affected sectors is unchanged. The correction has been applied for coal, electricity, and gas to sectors 5.00-10.00 (mining) and 13.00-64.12 (manufacturing) with a few exceptions, and the results are incorporated in Table 3. That is, the values of (DIRBTU) in Table 3 are computed from the energies of Table 2 and the appropriate normalized transfer factors. The average value of $| g_j/\langle g_j\rangle_i - 1 |$ is approximately 0.1. I have not included the transfer factors in this report. They are available on request.

BEA does not use this transfer procedure for the trade, construction, and service sectors;(1) hence no correction is needed. Since the refined petroleum energy data I used(12) is already compatible with I/O classification, no correction is necessary for this energy.

Table 1. Industry Classification of the 1963 Input-Output Tables.

Industry Classification of the 1963 Input-Output Tables

The underlined titles represent the groupings of industries used for the summary version of the 1963 tables and were also used in the 1958 and 1961 input-output tables prepared by the Office of Business Economics.

Industry number and title		Related SIC codes (1957 edition)
AGRICULTURAL, FORESTRY & FISHERIES		
	1 Livestock & livestock products	
1.01	Dairy farm products	0132, pt. 014, pt. 02
1.02	Poultry & eggs	0133, pt. 014, pt. 02
1.03	Meat, animals & miscellaneous livestock products	0139, pt. 014, 0193, pt. 0729, pt. 02
	2 Other agricultural products	
2.01	Cotton	0112, pt. 014, pt. 02
2.02	Food feed grains & grass seeds	0113, pt. 0119, pt. 014, pt. 02
2.03	Tobacco	pt. 0119, pt. 014, pt. 02
2.04	Fruits & tree nuts	0122, pt. 014, pt. 02
2.05	Vegetables, sugar & miscellaneous crops	0123, pt. 0119, pt. 014, pt. 02
2.06	Oil bearing crops	pt. 0119, pt. 014, pt. 02
2.07	Forest, greenhouse & nursery products	0192, pt. 014, pt. 02
	3 Forestry & fishery products	
3.00	Forestry & fishery products	074, 081, 082, 084, 086, 091
	4 Agricultural, forestry & fishery services	
4.00	Agricultural, forestry & fishery services	071, 0723, 073, pt. 0729, 085, 098
MINING		
	5 Iron & ferroalloy ores mining	
5.00	Iron & ferroalloy ores mining	1011, 106
	6 Nonferrous metal ores mining	
6.01	Copper ore mining	102
6.02	Nonferrous metal ores mining, except copper	103, 104, 105, 108, 109
	7 Coal mining	
7.00	Coal mining	11, 12
	8 Crude petroleum & natural gas	
8.00	Crude petroleum & natural gas	1311, 1321
	9 Stone & clay mining & quarrying	
9.00	Stone & clay mining & quarrying	141, 142, 144, 145, 148, 149
	10 Chemicals & fertilizer mineral mining	
10.00	Chemical & fertilizer mineral mining	147
CONSTRUCTION		
	11 New construction	
11.01	New construction, residential buildings (nonfarm)	pt. 15, pt. 16, pt. 17, pt. 6561

Industry number and title		Related SIC codes (1957 edition)
11.02	New construction, nonresidential buildings	pt. 15, pt. 17
11.03	New construction, public utilities	pt. 15, pt. 16, pt. 17
11.04	New construction, highways	pt. 16, pt. 17
11.05	New construction, all other	pt. 15, pt. 16, pt. 17, 138
	12 Maintenance & repair construction	
12.01	Maintenance & repair construction, residential buildings (nonfarm)	pt. 15, pt. 17
12.02	Maintenance & repair construction, all other	pt. 15, pt. 16, pt. 17
MANUFACTURING		
	13 Ordnance & accessories	
13.01	Complete guided missiles	1925
13.02	Ammunition, except for small arms, n.e.c.	1929
13.03	Tanks & tank components	1931
13.04	Sighting & fire control equipment	1941
13.05	Small arms	1951
13.06	Small arms ammunition	1961
13.07	Other ordnance & accessories	1911, 1999
	14 Food & kindred products	
14.01	Meat products	201
14.02	Creamery butter	2021
14.03	Cheese, natural & processed	2022
14.04	Condensed & evaporated milk	2023
14.05	Ice cream & frozen desserts	2024
14.06	Fluid milk	2026
14.07	Canned & cured sea foods	2031
14.08	Canned specialties	2032
14.09	Canned fruits & vegetables	2033
14.10	Dehydrated food products	2034
14.11	Pickles, sauces & salad dressings	2035
14.12	Fresh or frozen packaged fish	2036
14.13	Frozen fruits & vegetables	2037
14.14	Flour & cereal preparations	2041, 2043, 2045
14.15	Prepared feeds for animals & fowls	2042
14.16	Rice milling	2044
14.17	Wet corn milling	2046
14.18	Bakery products	205
14.19	Sugar	206
14.20	Confectionery & related products	207
14.21	Alcoholic beverages	2082-5
14.22	Bottled & canned soft drinks	2086
14.23	Flavoring extracts & sirups, n.e.c.	2087
14.24	Cottonseed oil mills	2091
14.25	Soybean oil mills	2092
14.26	Vegetable oil mills, n.e.c.	2093
14.27	Animal & marine fats & oils	2094
14.28	Roasted coffee	2095
14.29	Shortening & cooking oils	2096
14.30	Manufactured ice	2097
14.31	Macaroni & spaghetti	2098
14.32	Food preparations, n.e.c.	2099

Industry number and title		Related SIC codes (1957 edition)
	15 Tobacco manufactures	
15.01	Cigarettes, cigars, etc.	2111, 2121, 2131
15.02	Tobacco stemming & redrying	2141
	16 Broad & narrow fabrics, yarn & thread mills	
16.01	Broadwoven fabric mills & fabric finishing plants	2211, 2221, 2231, 2261, 2262
16.02	Narrow fabric mills	2241
16.03	Yarn mills & finishing of textiles, n.e.c.	2269, 2281-3
16.04	Thread mills	2284
	17 Miscellaneous textile goods & floor coverings	
17.01	Floor coverings	227
17.02	Felt goods, n.e.c.	2291
17.03	Lace goods	2292
17.04	Paddings & upholstery fillings	2293
17.05	Processed textile waste	2294
17.06	Coated fabrics, not rubberized	2295
17.07	Tire cord & fabric	2296
17.08	Scouring & combing plants	2297
17.09	Cordage & twine	2298
17.10	Textile goods, n.e.c.	2299
	18 Apparel	
18.01	Hosiery	2251, 2252
18.02	Knit apparel mills	2253, 2254, 2259
18.03	Knit fabric mills	2256
18.04	Apparel made from purchased materials	23 (exc. 239), 3992
	19 Miscellaneous fabricated textile products	
19.01	Curtains & draperies	2391
19.02	Housefurnishings, n.e.c.	2392
19.03	Fabricated textile products, n.e.c.	2393-9
	20 Lumber & wood products, except containers	
20.01	Logging camps & logging contractors	2411
20.02	Sawmills & planing mills, general	2421
20.03	Hardwood dimension & flooring	2426
20.04	Special product sawmills, n.e.c.	2429
20.05	Millwork	2431
20.06	Veneer & plywood	2432
20.07	Prefabricated wood structures	2433
20.08	Wood preserving	2491
20.09	Wood products, n.e.c.	2499
	21 Wooden containers	
21.00	Wooden containers	244
	22 Household furniture	
22.01	Wood household furniture	2511, 2519
22.02	Upholstered household furniture	2512
22.03	Metal household furniture	2514
22.04	Mattresses & bedsprings	2515
	23 Other furniture & fixtures	
23.01	Wood office furniture	2521
23.02	Metal office furniture	2522
23.03	Public building furniture	2531
23.04	Wood partitions & fixtures	2541
23.05	Metal partitions & fixtures	2542
23.06	Venetian blinds & shades	2591
23.07	Furniture & fixtures, n.e.c.	2599

Industry number and title		Related SIC codes (1957 edition)
	24 Paper & allied products except containers & boxes	
24.01	Pulp mills	2611
24.02	Paper mills, except building paper	2621
24.03	Paperboard mills	2631
24.04	Envelopes	2642
24.05	Sanitary paper products	2647
24.06	Wallpaper & building paper & board mills	2644, 2661
24.07	Converted paper, products n.e.c. except containers & boxes	2641, 2643, 2645, 2646, 2649
	25 Paperboard containers & boxes	
25.00	Paperboard containers & boxes	265
	26 Printing & publishing	
26.01	Newspapers	2711
26.02	Periodicals	2721
26.03	Book printing & publishing	273
26.04	Miscellaneous publishing	2741
26.05	Commercial printing	2751, 2752
26.06	Manifold business forms, blankbooks & binders	2761, 2782
26.07	Greeting card publishing	2771
26.08	Miscellaneous printing services	2753, 2789, 279
	27 Chemicals & selected chemical products	
27.01	Industrial inorganic & organic chemicals	281 except 28195
27.02	Fertilizers	2871, 2872
27.03	Agricultural chemicals, n.e.c.	2879
27.04	Miscellaneous chemical products	2861, 289
	28 Plastics & synthetic materials	
28.01	Plastics materials & resins	2821
28.02	Synthetic rubber	2822
28.03	Cellulosic man-made fibers	2823
28.04	Organic fibers, noncellulosic	2824
	29 Drugs, cleaning & toilet preparations	
29.01	Drugs	283
29.02	Cleaning preparations	284 except 2844
29.03	Toilet preparations	2844
	30 Paints & allied products	
30.00	Paints & allied products	2851
	31 Petroleum refining & related industries	
31.01	Petroleum refining & related products	2911, 299
31.02	Paving mixtures & blocks	2951
31.03	Asphalt felts & coatings	2952
	32 Rubber & miscellaneous plastics products	
32.01	Tires & inner tubes	3011
32.02	Rubber footwear	3021
32.03	Reclaimed rubber & miscellaneous rubber products, n.e.c.	3031, 3069
32.04	Miscellaneous plastics products	3079
	33 Leather tanning & industrial leather products	
33.00	Leather tanning & industrial leather products	3111, 3121

Industry number and title		Related SIC codes (1957 edition)
	34 Footwear & other leather products	
34.01	Footwear cut stock	3131
34.02	Footwear except rubber	314
34.03	Other leather products	3151, 3161, 317, 3199
	35 Glass & glass products	
35.01	Glass & glass products except containers	3211, 3229, 3231
35.02	Glass containers	3221
	36 Stone & clay products	
36.01	Cement, hydraulic	3241
36.02	Brick & structural clay tile	3251
36.03	Ceramic wall & floor tile	3253
36.04	Clay refractories	3255
36.05	Structural clay products, n.e.c.	3259
36.06	Vitreous plumbing fixtures	3261
36.07	Food utensils, pottery	3262, 3263
36.08	Porcelain electrical supplies	3264
36.09	Pottery products, n.e.c.	3269
36.10	Concrete block & brick	3271
36.11	Concrete products, n.e.c.	3272
36.12	Ready-mixed concrete	3273
36.13	Lime	3274
36.14	Gypsum products	3275
36.15	Cut stone & stone products	3281
36.16	Abrasive products	3291
36.17	Asbestos products	3292
36.18	Gaskets & insulations	3293
36.19	Minerals, ground or treated	3295
36.20	Mineral wool	3296
36.21	Nonclay refractories	3297
36.22	Nonmetallic mineral products, n.e.c.	3299
	37 Primary iron & steel manufacturing	
37.01	Blast furnace & basic steel products	331
37.02	Iron & steel foundries	332
37.03	Iron & steel forgings	3391
37.04	Primary metal products n.e.c.	3399
	38 Primary nonferrous metals manufacturing	
38.01	Primary copper	3331
38.02	Primary lead	3332
38.03	Primary zinc	3333
38.04	Primary aluminum	3334, 28195
38.05	Primary nonferrous metals, n.e.c.	3339
38.06	Secondary nonferrous metals	3341
38.07	Copper rolling & drawing	3351
38.08	Aluminum rolling & drawing	3352
38.09	Nonferrous rolling & drawing, n.e.c.	3356
38.10	Nonferrous wire drawing & insulating	3357
38.11	Aluminum castings	3361
38.12	Brass, bronze & copper castings	3362
38.13	Nonferrous castings, n.e.c.	3369
38.14	Nonferrous forgings	3392
	39 Metal containers	
39.01	Metal cans	3411
39.02	Metal barrels, drums & pails	3491

Industry number and title		Related SIC codes (1957 edition)
	40 Heating, plumbing & fabricated structural metal products	
40.01	Metal sanitary ware	3431
40.02	Plumbing fittings & brass goods	3432
40.03	Heating equipment except electric	3433
40.04	Fabricated structural steel	3441
40.05	Metal doors, sash & trim	3442
40.06	Fabricated plate work (boiler shops)	3443
40.07	Sheet metal work	3444
40.08	Architectural metal work	3446
40.09	Miscellaneous metal work	3449
	41 Screw machine products, bolts, nuts, etc. & metal stampings	
41.01	Screw machine products & bolts, nuts, rivets & washers	345
41.02	Metal stampings	3461
	42 Other fabricated metal products	
42.01	Cutlery	3421
42.02	Hand & edge tools including saws	3423, 3425
42.03	Hardware, n.e.c.	3429
42.04	Coating, engraving & allied services	3471, 3479
42.05	Miscellaneous fabricated wire products	3481
42.06	Safes & vaults	3492
42.07	Steel springs	3493
42.08	Pipe, valves & pipe fittings	3494, 3498
42.09	Collapsible tubes	3496
42.10	Metal foil & leaf	3497
42.11	Fabricated metal products, n.e.c.	3499
	43 Engines & turbines	
43.01	Steam engines & turbines	3511
43.02	Internal combustion engines, n.e.c.	3519
	44 Farm machinery	
44.00	Farm machinery	3522
	45 Construction, mining, oil field machinery, equipment	
45.01	Construction machinery	3531
45.02	Mining machinery	3532
45.03	Oil field machinery	3533
	46 Materials handling machinery & equipment	
46.01	Elevators & moving stairways	3534
46.02	Conveyors & conveying equipment	3535
46.03	Hoists, cranes & monorails	3536
46.04	Industrial trucks & tractors	3537
	47 Metalworking machinery & equipment	
47.01	Machine tools, metal cutting types	3541
47.02	Machine tools, metal forming types	3542
47.03	Special dies & tools & machine tool accessories	3544, 3545
47.04	Metalworking machinery, n.e.c.	3548
	48 Special industry machinery & equipment	
48.01	Food products machinery	3551
48.02	Textile machinery	3552
48.03	Woodworking machinery	3553
48.04	Paper industries machinery	3554
48.05	Printing trades machinery	3555
48.06	Special industry machinery, n.e.c.	3559

Industry number and title		Related SIC codes (1957 edition)
	49 General industrial machinery & equipment	
49.01	Pumps & compressors	3561
49.02	Ball & roller bearings	3562
49.03	Blowers & fans	3564
49.04	Industrial patterns	3565
49.05	Power transmission equipment	3566
49.06	Industrial furnaces & ovens	3567
49.07	General industrial machinery, n.e.c.	3569
	50 Machine shop products	
50.00	Machine shop products	359
	51 Office, computing & accounting machines	
51.01	Computing & related machines	3571
51.02	Typewriters	3572
51.03	Scales & balances	3576
51.04	Office machines, n.e.c.	3579
	52 Service industry machines	
52.01	Automatic merchandising machines	3581
52.02	Commercial laundry equipment	3582
52.03	Refrigeration machinery	3585
52.04	Measuring & dispensing pumps	3586
52.05	Service industry machines, n.e.c.	3589
	53 Electric transmission & distribution equipment & electrical industrial apparatus	
53.01	Electric measuring instruments	3611
53.02	Transformers	3612
53.03	Switchgear & switchboard apparatus	3613
53.04	Motors & generators	3621
53.05	Industrial controls	3622
53.06	Welding apparatus	3623
53.07	Carbon & graphite products	3624
53.08	Electrical industrial apparatus, n.e.c.	3629
	54 Household appliances	
54.01	Household cooking equipment	3631
54.02	Household refrigerators & freezers	3632
54.03	Household laundry equipment	3633
54.04	Electric housewares & fans	3634
54.05	Household vacuum cleaners	3635
54.06	Sewing machines	3636
54.07	Household appliances, n.e.c.	3639
	55 Electric lighting & wiring equipment	
55.01	Electric lamps	3641
55.02	Lighting fixtures	3642
55.03	Wiring devices	3643, 3644
	56 Radio, television & communication equipment	
56.01	Radio & TV receiving sets	3651
56.02	Phonograph records	3652
56.03	Telephone & telegraph apparatus	3661
56.04	Radio & TV communication equipment	3662
	57 Electronic components & accessories	
57.01	Electron tubes	3671, 3672, 3673
57.02	Semiconductors	3674
57.03	Electronic components, n.e.c.	3679

Industry number and title		Related SIC codes (1957 edition)
	58 Miscellaneous electrical machinery, equipment & supplies	
58.01	Storage batteries	3691
58.02	Primary batteries, wet & dry	3692
58.03	X-ray apparatus & tubes	3693
58.04	Engine electrical equipment	3694
58.05	Electrical equipment, n.e.c.	3699
	59 Motor vehicles & equipment	
59.01	Truck & bus bodies	3713
59.02	Truck trailers	3715
59.03	Motor vehicles & parts	3717
	60 Aircraft & parts	
60.01	Aircraft	3721
60.02	Aircraft engines & parts	3722
60.03	Aircraft propellers & parts	3723
60.04	Aircraft equipment, n.e.c.	3729
	61 Other transportation equipment	
61.01	Shipbuilding & repairing	3731
61.02	Boatbuilding & repairing	3732
61.03	Locomotives & parts	3741
61.04	Railroad & street cars	3742
61.05	Motorcycles, bicycles & parts	3751
61.06	Trailer coaches	3791
61.07	Transportation equipment, n.e.c.	3799
	62 Professional, scientific & controlling instruments & supplies	
62.01	Engineering & scientific instruments	3811
62.02	Mechanical measuring devices	3821
62.03	Automatic temperature controls	3822
62.04	Surgical & medical instruments	3841
62.05	Surgical appliances & supplies	3842
62.06	Dental equipment & supplies	3843
62.07	Watches, clocks & parts	387
	63 Optical, ophthalmic, & photographic equipment & supplies	
63.01	Optical instruments & lenses	3831
63.02	Ophthalmic goods	3851
63.03	Photographic equipment & supplies	3861
	64 Miscellaneous manufacturing	
64.01	Jewelry, including costume & silverware	391, 3961
64.02	Musical instruments & parts	3931
64.03	Games, toys, etc.	3941
64.04	Sporting & athletic goods, n.e.c.	3949
64.05	Pens, pencils, etc.	395
64.06	Artificial flowers	3962
64.07	Buttons, needles, pins & fasteners	3963, 3964
64.08	Brooms & brushes	3981
64.09	Hard surface floor covering	3982
64.10	Morticians goods	3988
64.11	Signs & advertising displays	3993
64.12	Miscellaneous manufactures, n.e.c.	3983, 3984, 3987, 3995, 3999

Industry number and title		Related SIC codes (1957 edition)
TRANSPORTATION, COMMUNICATION, ELECTRIC, GAS, & SANITARY SERVICES		
	65 Transportation & warehousing	
65.01	Railroads & related services	40, 474
65.02	Local, suburban & interurban highway passenger transportation	41
65.03	Motor freight transportation & warehousing	42, 473
65.04	Water transportation	44
65.05	Air transportation	45
65.06	Pipe line transportation	46
65.07	Transportation services	47, except 473, 474
	66 Communications except radio & television broadcasting	
66.00	Communications, except radio & television	48, except 483
	67 Radio & TV broadcasting	
67.00	Radio & television broadcasting	483
	68 Electric, gas, water & sanitary services	
68.01	Electric utilities	491, pt. 493
68.02	Gas utilities	492, pt. 493
68.03	Water & sanitary services	494, 495, 496, 497, pt. 493
WHOLESALE & RETAIL TRADE		
	69 Wholesale & retail trade	
69.01	Wholesale trade	50 (except manufacturers' sales offices)
69.02	Retail trade	52, 53, 54, 55, 56, 57, 58, 59, 7396
FINANCE INSURANCE & REAL ESTATE		
	70 Finance & insurance	
70.01	Banking	60
70.02	Credit agencies	61, 67
70.03	Security & commodity brokers	62
70.04	Insurance carriers	63
70.05	Insurance agents & brokers	64
	71 Real estate & rental	
71.01	Owner-occupied dwellings	NA
71.02	Real estate	65 (except pt. 6561), 66
SERVICES		
	72 Hotels & lodging places; personal & repair services, except automobile repair	
72.01	Hotels & lodging places	70
72.02	Personal & repair services, except auto repair, barber, & beauty shops	72 (except 723, 724), 76 (except 7694 & pt. 7699)
72.03	Barber & beauty shops	723, 724
	73 Business Services	
73.01	Miscellaneous business services	73 (except 731, 7396), 7694, pt. 7699
73.02	Advertising	731
73.03	Miscellaneous professional services	81, 89 (except 8921)

	Industry number and title	Related SIC codes (1957 edition)
	74 Research & development	
74.00	Eliminated as a separate industry in the 1963 study. Research & development performed for sale is distributed to the purchaser by each of the industries performing the research & development.	
	75 Automobile repair & services	
75.00	Automobile repair & services	75
	76 Amusements	
76.01	Motion pictures	78
76.02	Amusement & recreation services	79
	77 Medical, educational services & nonprofit organizations	
77.01	Doctors & dentists	801, 802, 803, 804
77.02	Hospitals	8061
77.03	Other medical & health services	0722, 807, 809
77.04	Educational services	82
77.05	Nonprofit organizations	84, 86, 8921
GOVERNMENT ENTERPRISES		
	78 Federal Government enterprises	
78.01	Post Office	
78.02	Federal electric utilities	
78.03	Commodity Credit Corporation	
78.04	Other Federal Government enterprises	
	79 State & local government enterprises	
79.01	Local government passenger transit	
79.02	State & local electric utilities	
79.03	Other state & local government enterprises	
IMPORTS		
	80 Gross imports of goods & services	
80.01	Directly allocated imports	
80.02	Transferred imports	
DUMMY INDUSTRIES		
	81 Business travel, entertainment & gifts	
81.00	Business travel, entertainment & gifts	
	82 Office supplies	
82.00	Office supplies	
	83 Scrap, used & secondhand goods	
83.00	Scrap, used & secondhand goods	
SPECIAL INDUSTRIES		
	84 Government industry	
84.00	Government industry	
	85 Rest of the world industry	
85.00	Rest of the world industry	
	86 Household industry	
86.00	Household industry	

Industry number and title		Related SIC codes (1957 edition)
	87 Inventory valuation adjustment	
87.00	Inventory valuation adjustment	
88.00	Total intermediate output	
	Personal consumption expenditures	
96.60	Personal consumption expenditures	
	Gross private fixed capital formation	
96.70	Gross private fixed capital formation	
	Net inventory change	
96.80	Net inventory change	
	Net exports	
96.90	Net exports	
	Federal Government purchases	
97.10	Federal Government purchases, defense	
97.20	Federal Government purchases, other	
	State and local government purchases	
98.60	State and local government purchases, education	
98.70	State and local government purchases, health, welfare and sanitation	
98.80	State and local government purchases, safety	
98.90	State and local government purchases, other	
99.02	Total final demand	
99.03	Total output	
99.04	Transfers	
I	Total intermediate inputs	
V.A.	Value added	
T	Total inputs	
TR	Transfers	

Table 2. Energy supplied directly to consuming sectors. The five kinds of energy are coal, crude oil and gas (extraction), refined petroleum, electricity (1 KW hr. = 3413 Btu), and gas (sales). Units are Btu. Figures in parenthesis represent sales from primary to secondary energy producers, which receive special treatment in computation, as discussed in Section II C.

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DIRECT ENERGY MATRIX (5 BY 362)
             1          2          3          4          5          6          7          8          9         10
  CODE     101        102        103        201        202        203        204        205        206        207

1    700 0.0        0.2138E 14 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.2483E 13
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.3159E 14 0.2148E 14 0.5701E 14 0.5742E 14 0.4125E 15 0.3452E 14 0.2206E 14 0.4111E 14 0.6589E 14 0.1843E 14
4   6801 0.8734E 13 0.3096E 13 0.1151E 14 0.6286E 13 0.7810E 13 0.1386E 13 0.2173E 13 0.2543E 13 0.2080E 13 0.6007E 12
5   6802 0.0        0.1748E 14 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.1011E 14

DIRECT ENERGY MATRIX (5 BY 362)
            11         12         13         14         15         16         17         18         19         20
  CODE     300        400        500        601        602        700        800        900       1000       1101

1    700 0.0        0.0        0.2527E 14 0.3796E 13 0.2236E 13 0.1020E 15 0.0        0.1004E 14 0.4420E 13 0.0
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.8759E 15 0.0        0.0        0.0
3   3101 0.2694E 13 0.7544E 13 0.1833E 14 0.3738E 13 0.4131E 13 0.1824E 14 0.3334E 14 0.3700E 14 0.1220E 14 0.1625E 15
4   6801 0.2280E 11 0.1143E 12 0.6119E 13 0.8742E 13 0.4416E 13 0.1833E 14 0.2178E 14 0.1059E 14 0.5569E 13 0.1044E 14
5   6802 0.1362E 11 0.6960E 11 0.1299E 14 0.1126E 14 0.6863E 13 0.1023E 13 0.1099E 15 0.2737E 14 0.6522E 14 0.2011E 14

DIRECT ENERGY MATRIX (5 BY 362)
            21         22         23         24         25         26         27         28         29         30
  CODE    1102       1103       1104       1105       1201       1202       1301       1302       1303       1304

1    700 0.0        0.0        0.0        0.0        0.0        0.0        0.2424E 13 0.3232E 13 0.8080E 12 0.0
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.1033E 15 0.4221E 14 0.1821E 15 0.5514E 14 0.4356E 14 0.3183E 15 0.2842E 13 0.4178E 12 0.2179E 12 0.1138E 12
4   6801 0.6193E 13 0.1436E 13 0.1166E 13 0.1360E 13 0.2941E 13 0.6098E 13 0.3080E 13 0.1051E 13 0.4216E 12 0.2108E 12
5   6802 0.1201E 14 0.2790E 13 0.2495E 13 0.2640E 13 0.5731E 13 0.1177E 14 0.3113E 13 0.3480E 12 0.5737E 11 0.3952E 11

DIRECT ENERGY MATRIX (5 BY 362)
            31         32         33         34         35         36         37         38         39         40
  CODE    1305       1306       1307       1401       1402       1403       1404       1405       1406       1407

1    700 0.8080E 12 0.1616E 13 0.1067E 13 0.2204E 14 0.5307E 13 0.2850E 13 0.1292E 14 0.5328E 12 0.8549E 13 0.9273E 11
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.8487E 11 0.9200E 11 0.3461E 12 0.2267E 14 0.3740E 13 0.3589E 13 0.3000E 13 0.3893E 13 0.3280E 14 0.1609E 12
4   6801 0.2788E 12 0.4216E 12 0.1329E 13 0.1069E 14 0.8262E 12 0.9486E 12 0.8534E 12 0.2152E 13 0.7592E 13 0.1870E 12
5   6802 0.1281E 13 0.1283E 13 0.1281E 13 0.4572E 14 0.9644E 13 0.3964E 13 0.8180E 13 0.1842E 13 0.2209E 14 0.3993E 12

DIRECT ENERGY MATRIX (5 BY 362)
            41         42         43         44         45         46         47         48         49         50
  CODE    1408       1409       1410       1411       1412       1413       1414       1415       1416       1417

1    700 0.8704E 13 0.6698E 13 0.3355E 12 0.5986E 12 0.0        0.2895E 12 0.5364E 13 0.1965E 13 0.0        0.4025E 14
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.6153E 13 0.9493E 13 0.1188E 12 0.2692E 12 0.1490E 12 0.9242E 13 0.2841E 13 0.6615E 13 0.1876E 12 0.1312E 13
4   6801 0.7140E 12 0.1829E 13 0.3230E 12 0.4454E 12 0.3264E 12 0.2877E 13 0.4859E 13 0.4104E 13 0.3264E 12 0.7072E 12
5   6802 0.4018E 13 0.1855E 14 0.4855E 13 0.1405E 13 0.2413E 12 0.9312E 13 0.4843E 13 0.1655E 14 0.1115E 13 0.9334E 13

DIRECT ENERGY MATRIX (5 BY 362)
            51         52         53         54         55         56         57         58         59         60
  CODE    1418       1419       1420       1421       1422       1423       1424       1425       1426       1427

1    700 0.1280E 13 0.3713E 14 0.5640E 13 0.3387E 14 0.3629E 12 0.0        0.0        0.1200E 14 0.2833E 12 0.5520E 13
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.3111E 14 0.1763E 14 0.5119E 13 0.2185E 14 0.9277E 13 0.2474E 13 0.3891E 12 0.2702E 13 0.9744E 11 0.7950E 13
4   6801 0.4770E 13 0.7548E 12 0.2472E 13 0.4284E 13 0.1510E 13 0.1870E 12 0.2618E 13 0.2281E 13 0.3876E 12 0.8228E 12
5   6802 0.3017E 14 0.5479E 14 0.4134E 13 0.2548E 14 0.3737E 13 0.2504E 12 0.5204E 13 0.1094E 14 0.1462E 13 0.8684E 13
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DIRECT ENERGY MATRIX (5 BY 362)
            61         62         63         64         65         66         67         68         69         70
  CODE    1428       1429       1430       1431       1432       1501       1502       1601       1602       1603

1    700 0.0        0.8328E 13 0.0        0.5254E 12 0.5237F 13 0.6989E 13 0.2112F 13 0.6284E 14 0.2774E 12 0.4031E 13
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.7712E 12 0.8768E 13 0.3537E 12 0.1297F 12 0.4231E 13 0.1188E 13 0.1831E 13 0.4960E 14 0.1368E 12 0.4221E 13
4   6801 0.7038E 12 0.1510E 13 0.2526E 13 0.3162E 12 0.1268E 13 0.1336E 13 0.4012E 12 0.3149F 14 0.5134E 12 0.8741F 13
5   6802 0.3774E 13 0.1247E 14 0.0        0.6963E 12 0.9630E 13 0.1536E 13 0.4770E 12 0.3733E 14 0.5033E 12 0.2614E 13

DIRECT ENERGY MATRIX (5 BY 362)
            71         72         73         74         75         76         77         78         79         80
  CODE    1604       1701       1702       1703       1704       1705       1706       1707       1708       1709

1    700 0.2003E 13 0.4125E 13 0.3393E 12 0.0        0.8568E 12 0.0        0.1159E 13 0.2326E 12 0.0        0.5370E 12
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.1129E 12 0.3009E 12 0.5260E 11 0.3039E 11 0.7041E 11 0.4149E 11 0.4017E 13 0.1458E 12 0.9932E 11 0.4740E 12
4   6801 0.7208E 12 0.1102E 13 0.2516E 12 0.7140E 11 0.2346E 12 0.2142E 12 0.6154E 12 0.1367F 13 0.2754E 12 0.3502E 12
5   6802 0.3140E 12 0.4023E 13 0.5353E 12 0.0        0.3645E 12 0.0        0.1515E 13 0.5841E 12 0.5572E 12 0.2330E 12

DIRECT ENERGY MATRIX (5 BY 362)
            81         82         83         84         85         86         87         88         89         90
  CODE    1710       1801       1802       1803       1804       1901       1902       1903       2001       2002

1    700 0.0        0.3245E 13 0.1394E 13 0.1412E 13 0.2944E 13 0.0        0.6358E 12 0.5771E 12 0.0        0.1685E 13
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.8298E 11 0.4815E 13 0.2302E 13 0.7542E 13 0.1119E 14 0.1186E 12 0.7904E 12 0.5737E 12 0.1225E 14 0.1506E 14
4   6801 0.3638E 12 0.1632E 13 0.9860E 12 0.1081E 13 0.6749E 13 0.1836E 12 0.4420E 12 0.1136E 13 0.2006E 12 0.7817E 13
5   6802 0.4348E 12 0.2769E 13 0.3531E 13 0.9843E 12 0.5169E 13 0.0        0.5997E 12 0.3384E 12 0.3380E 13 0.1059E 14

DIRECT ENERGY MATRIX (5 BY 362)
            91         92         93         94         95         96         97         98         99        100
  CODE    2003       2004       2005       2006       2007       2008       2009       2100       2201       2202

1    700 0.3496E 12 0.0        0.7595E 12 0.2250E 13 0.3099E 12 0.2160E 13 0.0        0.1036F 12 0.6649E 13 0.8063E 12
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.1064E 13 0.1709E 12 0.7090E 12 0.3300E 13 0.2277E 12 0.2102E 13 0.4378E 13 0.3920E 12 0.6639E 13 0.9180E 12
4   6801 0.6358E 12 0.1190E 12 0.1302E 13 0.3125E 13 0.2108E 12 0.2108E 12 0.2366E 13 0.5882E 12 0.2543E 13 0.5984E 12
5   6802 0.7777E 12 0.0        0.1104E 13 0.5980E 13 0.4859E 12 0.5174E 13 0.3410F 13 0.7231E 12 0.1256E 13 0.5859F 12

DIRECT ENERGY MATRIX (5 BY 362)
           101        102        103        104        105        106        107        108        109        110
  CODE    2203       2204       2301       2302       2303       2304       2305       2306       2307       2401

1    700 0.5208F 12 0.1482E 12 0.7938E 12 0.1144E 13 0.7566E 12 0.2867E 12 0.4874E 12 0.1523F 12 0.3319E 12 0.1416E 14
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.3526E 12 0.4316E 12 0.6413F 11 0.2789E 12 0.1987E 12 0.3248E 12 0.3345E 12 0.1435E 12 0.8005E 11 0.2911E 14
4   6801 0.5304E 12 0.3570E 12 0.1020E 12 0.4760E 12 0.3162E 12 0.3196E 12 0.4216E 12 0.2244E 12 0.1496E 12 0.4784E 13
5   6802 0.1191E 13 0.8168E 12 0.0        0.1627E 13 0.6138E 12 0.8064E 12 0.1399E 13 0.3585E 12 0.2121E 12 0.2941E 14

DIRECT ENERGY MATRIX (5 BY 362)
           111        112        113        114        115        116        117        118        119        120
  CODE    2402       2403       2404       2405       2406       2407       2500       2601       2602       2603

1    700 0.2035E 15 0.1673E 15 0.0        0.8198E 12 0.3681E 14 0.8446E 13 0.4137E 13 0.0        0.4744E 12 0.3817E 12
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.9242E 14 0.8375E 14 0.1649E 12 0.9728E 12 0.8170E 13 0.1260E 14 0.9634E 13 0.8281E 13 0.1788E 13 0.2741E 13
4   6801 0.3090E 14 0.1207E 14 0.3400E 12 0.7752E 12 0.4760E 11 0.4964E 13 0.5056E 13 0.4495E 13 0.6834E 12 0.1006E 13
5   6802 0.1090E 15 0.9092E 14 0.5984E 12 0.1030E 12 0.5472E 14 0.8519E 13 0.1171E 14 0.4540E 13 0.5403E 12 0.1288E 13
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OIRECT ENERGY MATRIX (5 BY 362)
          121        122        123        124        125        126        127        128        129        130
  COOS   2604       2605       2606       2607       2608       2701       2702       2703       2704       2801

1   700 0.0        0.1858E 13 0.0        0.0        0.0        0.5618E 15 0.0        0.0        0.2128E 14 0.4459E 14
2   800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.1654E 15 0.0
3  3101 0.4004E 12 0.8615E 13 0.8511E 12 0.2869F 12 0.5907E 12 0.3926E 15 0.2638E 14 0.9356E 13 0.8580E 14 0.7564E 14
4  6801 0.1734E 12 0.5535E 13 0.6800E 12 0.3536E 12 0.1013E 13 0.2840E 15 0.4366E 13 0.3196E 12 0.4648E 13 0.9078E 13
5  6802 0.1873E 12 0.8641E 13 0.4147E 12 0.5656E 12 0.0        0.9034E 15 0.1332E 14 0.2292E 13 0.1875E 15 0.2272E 14

OIRECT ENERGY MATRIX (5 BY 362)
          131        132        133        134        135        136        137        138        139        140
  CODE   2802       2803       2804       2901       2902       2903       3000       3101       3102       3103

1   700 0.0        0.7284E 14 0.0        0.1400E 14 0.7679E 13 0.0        0.1571E 13 0.1962E 14 0.0        0.2670E 13
2   800 0.0        0.0        0.0        0.0        0.0        0.0        0.0       (0. 1980E 17)0.0        0.0
3  3101 0.7168E 14 0.9378E 13 0.2134E 14 0.7870E 14 0.5992E 14 0.3217E 14 0.5827E 14 0.1420E 16 0.1699E 15 0.1752E 15
4  6801 0.3264E 13 0.9282E 12 0.3488E 13 0.4505E 13 0.1890E 13 0.4998E 12 0.1489E 13 0.4110E 14 0.7888E 12 0.8058E 12
5  6802 0.1603E 14 0.8758E 13 0.1872E 14 0.6221E 13 0.1296E 14 0.4795E 12 0.3323E 13 0.7710E 15 0.7356E 13 0.9155E 13

OIRECT ENERGY MATRIX (5 BY 362)
          141        142        143        144        145        146        147        148        149        150
  CODE   3201       3202       3203       3204       3300       3401       3402       3403       3501       3502

1   700 0.3744E 14 0.2059E 12 0.1829E 14 0.3909E 13 0.8673E 13 0.1505E 12 0.1559E 13 0.0        0.1296E 14 0.1851E 13
2   800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3  3101 0.5826E 13 0.1802E 13 0.1356E 14 0.1015E 14 0.7937E 13 0.9933E 11 0.3725E 13 0.3703E 12 0.3708E 13 0.1385E 14
4  6801 0.7388E 13 0.7820E 12 0.7055E 13 0.8660E 13 0.1044E 13 0.1836E 12 0.1506E 13 0.4420E 12 0.6919E 13 0.5885E 13
5  6802 0.1316E 14 0.2568E 12 0.9355E 13 0.8459E 13 0.5174E 13 0.1988E 12 0.7247E 12 0.4458E 11 0.9040E 14 0.8308E 14

OIRECT ENERGY MATRIX (5 BY 362)
          151        152        153        154        155        156        157        158        159        160
  COOE   3601       3602       3603       3604       3605       3606       3607       3608       3609       3610

1   700 0.2108E 15 0.0        0.0        0.0        0.8782E 13 0.1194E 13 0.0        0.1135E 13 0.0        0.0
2   800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3  3101 0.2589E 14 0.4889E 13 0.7973E 12 0.1020E 13 0.7530F 12 0.4467E 12 0.2209E 12 0.9143E 12 0.1951E 12 0.4483E 13
4  6801 0.2217E 14 0.1979E 13 0.3842E 12 0.7344E 12 0.5780E 12 0.3638E 12 0.2278E 12 0.3604E 12 0.2040E 12 0.6766E 12
5  6802 0.2012E 15 0.6580E 14 0.6540E 13 0.2144E 14 0.2571E 14 0.4486E 13 0.3910E 13 0.2561E 13 0.2538E 13 0.4356E 13

OIRECT ENERGY MATRIX (5 BY 362)
          161        162        163        164        165        166        167        168        169        170
  COOE   3611       3612       3613       3614       3615       3616       3617       3618       3619       3620

1   700 0.1449E 13 0.0        0.0        0.3177E 13 0.4694E 12 0.2983E 13 0.0        0.8643E 12 0.0        0.0
2   800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3  3101 0.4352E 13 0.1561E 14 0.3827E 13 0.7626E 13 0.1884E 13 0.3043E 13 0.3304E 13 0.2514E 13 0.3481E 13 0.1903E 13
4  6801 0.9010E 12 0.1680E 13 0.1367E 13 0.2043E 13 0.7718E 12 0.2060E 13 0.1445E 13 0.4250E 12 0.9962E 12 0.2026E 13
5  6802 0.5214E 13 0.5629E 13 0.1904E 14 0.1926E 14 0.1358E 12 0.4876E 13 0.2959E 13 0.6946E 12 0.6290E 13 0.1934E 14

OIRECT ENERGY MATRIX (5 BY 362)
          171        172        173        174        175        176        177        178        179        180
  CODE   3621       3622       3701       3702       3703       3704       3801       3802       3803       3804

1   700 0.0        0.0        0.2394E 16 0.6090E 14 0.1142E 14 0.0        0.7692E 13 0.0        0.1405E 14 0.0
2   800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3  3101 0.2008E 13 0.4345E 12 0.3429E 15 0.1141E 14 0.1319E 14 0.1579E 13 0.2521E 14 0.2499E 13 0.2081E 13 0.1267E 14
4  6801 0.9894E 12 0.1802E 12 0.1066F 15 0.1369F 14 0.1969E 13 0.1618E 13 0.3257E 13 0.3298E 12 0.4566F 13 0.9941E 14
5  6802 0.7528E 13 0.4290F 12 0.6123E 15 0.3995E 14 0.1647E 14 0.1281E 14 0.3501E 14 0.5048E 13 0.2759E 14 0.1218E 15
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DIRECT ENERGY MATRIX (5 BY 362)
            181        182        183        184        185        186        187        188        189        190
  CODE     3805       3806       3807       3808       3809       3810       3811       3812       3813       3814

1   700 0.0        0.1802E 13 0.6852E 13 0.6951E 13 0.1097E 13 0.3117E 13 0.8105E 12 0.0        0.4608E 12 0.0
2   800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3  3101 0.5815E 13 0.8068E 13 0.1079E 14 0.5099E 13 0.1065E 13 0.8509E 13 0.1731E 13 0.9459E 12 0.5471E 12 0.7550E 12
4  6801 0.5671E 13 0.1088E 13 0.4444E 13 0.9666E 13 0.2186E 13 0.4556E 13 0.2241E 13 0.5508E 12 0.7514E 12 0.7412E 12
5  6802 0.7400E 13 0.9420E 13 0.9239E 13 0.3234E 14 0.6734E 13 0.3669E 13 0.1092E 14 0.3126E 13 0.3286E 13 0.1970E 13

DIRECT ENERGY MATRIX (5 BY 362)
            191        192        193        194        195        196        197        198        199        200
  CODE     3901       3902       4001       4002       4003       4004       4005       4006       4007       4008

1   700 0.1974E 12 0.0        0.1474E 13 0.0        0.1583E 13 0.8809E 12 0.5935E 12 0.2461E 13 0.3962E 12 0.0
2   800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3  3101 0.4398E 13 0.1224E 13 0.1265E 13 0.9958E 12 0.2611E 13 0.3397E 13 0.1739E 13 0.5336E 13 0.2130E 13 0.6978E 12
4  6801 0.2309E 13 0.4114E 12 0.5236E 12 0.4556E 12 0.8806E 12 0.2118E 13 0.1309E 13 0.2329E 13 0.1017E 13 0.5110E 13
5  6802 0.1044E 13 0.1576E 13 0.3423E 13 0.1124E 13 0.2629E 13 0.3714E 13 0.2704E 13 0.6875E 13 0.3563E 13 0.5365E 12

DIRECT ENERGY MATRIX (5 BY 362)
            201        202        203        204        205        206        207        208        209        210
  CODE     4009       4101       4102       4201       4202       4203       4204       4205       4206       4207

1   700 0.3922E 11 0.1805E 13 0.3284E 13 0.0        0.1197E 13 0.5394E 13 0.1057E 13 0.4421E 12 0.0        0.0
2   800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3  3101 0.1172E 13 0.6026E 13 0.8557E 13 0.1272E 13 0.3581E 13 0.6340E 13 0.5686E 13 0.3505E 13 0.1100E 12 0.2211E 12
4  6801 0.6936E 12 0.2683E 13 0.4134E 13 0.3944E 12 0.9452E 12 0.2822E 13 0.3063E 13 0.1149E 13 0.5780E 11 0.2278E 12
5  6802 0.1354E 12 0.5505E 13 0.9290E 13 0.1589E 12 0.2851E 13 0.5139E 13 0.1240E 14 0.3081E 13 0.1515E 12 0.2992E 13

DIRECT ENERGY MATRIX (5 BY 362)
            211        212        213        214        215        216        217        218        219        220
  CODE     4208       4209       4210       4211       4301       4302       4400       4501       4502       4503

1   700 0.3772E 13 0.0        0.0        0.2516E 12 0.6427E 13 0.4625E 13 0.1470E 14 0.1031E 14 0.1181E 13 0.0
2   800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3  3101 0.5572E 13 0.5777E 11 0.1991E 12 0.5782E 12 0.1147E 14 0.4955E 13 0.5089E 13 0.4925E 13 0.6274E 12 0.8997E 12
4  6801 0.2533E 13 0.1190E 12 0.2720E 12 0.7854E 12 0.1051E 13 0.1792E 13 0.2509E 13 0.4090E 13 0.4794E 12 0.1108E 13
5  6802 0.7409E 13 0.2473E 12 0.0        0.1052E 13 0.9763E 12 0.2842E 13 0.1192E 14 0.5158E 13 0.1238E 13 0.4822E 13

DIRECT ENERGY MATRIX (5 BY 362)
            221        222        223        224        225        226        227        228        229        230
  CODE     4601       4602       4603       4604       4701       4702       4703       4704       4801       4802

1   700 0.0        0.5552E 12 0.5322E 12 0.6330E 12 0.2059E 13 0.0        0.2525E 12 0.1105E 13 0.0        0.1346E 13
2   800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3  3101 0.3026E 12 0.5253E 12 0.5256E 12 0.4599E 12 0.3690E 13 0.1816E 13 0.5005E 13 0.2063E 13 0.5927E 12 0.5796E 12
4  6801 0.2244E 12 0.3740E 12 0.2278E 12 0.4420E 12 0.1445E 13 0.5168E 12 0.3227E 13 0.9690E 12 0.5440E 12 0.6902E 12
5  6802 0.0        0.7536E 12 0.3902E 12 0.5993E 12 0.1472E 13 0.0        0.1356E 13 0.4318E 13 0.7402E 12 0.6088E 12

DIRECT ENERGY MATRIX (5 BY 362)
            231        232        233        234        235        236        237        238        239        240
  CODE     4803       4804       4805       4806       4901       4902       4903       4904       4905       4906

1   700 0.0        0.0        0.0        0.5226E 12 0.3341E 13 0.2318E 13 0.0        0.0        0.1700E 13 0.0
2   800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3  3101 0.2325E 12 0.3419E 12 0.3981E 12 0.4640E 13 0.3089E 13 0.4968E 13 0.1265E 13 0.1133E 12 0.2452E 13 0.2945E 12
4  6801 0.3400E 12 0.4148E 12 0.3434E 12 0.1081E 13 0.1476E 13 0.2322E 13 0.2754E 12 0.1292E 12 0.1414E 13 0.2380E 12
5  6802 0.6732E 12 0.6343E 12 0.3856E 12 0.2301E 13 0.3678E 13 0.4982E 13 0.6713E 12 0.2593E 12 0.3481E 13 0.4389E 12
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DIRECT ENERGY MATRIX (5 8Y 362)
            241          242          243          244          245          246          247          248          249          250
  CODE      4907         5000         5101         5102         5103         5104         5201         5202         5203         5204

1    700 0.0          0.9660E 12 0.2885E 13 0.0          0.0          0.6595E 12 0.5573E 12 0.2765E 12 0.0          0.0
2    800 0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
3   3101 0.1832E 13 0.4595E 13 0.5029E 13 0.2583E 12 0.9528E 11 0.2962E 12 0.1201E 12 0.7936E 11 0.2722E 13 0.6895E 11
4   6801 0.1108E 13 0.3227E 13 0.1989E 13 0.3672E 12 0.7820E 11 0.3230E 12 0.2652E 12 0.1423E 12 0.1297E 13 0.1190E 12
5   6802 0.1271E 13 0.4496E 13 0.1386E 13 0.1023E 13 0.7242E 11 0.2961E 12 0.6574E 12 0.2202E 12 0.0          0.2667E 12

DIRECT ENERGY MATRIX (5 BY 362)
            251          252          253          254          255          256          257          258          259          260
  CODE      5205         5301         5302         5303         5304         5305         5306         5307         5308         5401

1    700 0.8867E 11 0.0          0.3242E 13 0.4724E 12 0.3296E 13 0.0          0.2850E 12 0.1458E 13 0.0          0.1532E 13
2    800 0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
3   3101 0.2273E 12 0.5879E 12 0.4991E 12 0.6900E 12 0.2091E 13 0.3715E 12 0.1271E 12 0.1780E 13 0.1195E 12 0.1936E 12
4   6801 0.4896E 12 0.9214E 12 0.1601E 13 0.1146E 13 0.2914E 13 0.8194E 12 0.3536E 12 0.3818E 13 0.3298E 12 0.8024E 12
5   6802 0.4013E 12 0.6761E 12 0.1979E 13 0.1297E 13 0.3582E 13 0.1097E 13 0.1030E 13 0.5834E 13 0.8927E 12 0.2202E 13

DIRECT ENERGY MATRIX (5 8Y 362)
            261          262          263          264          265          266          267          268          269          270
  CODE      5402         5403         5404         5405         5406         5407         5501         5502         5503         5601

1    700 0.7616E 13 0.1998E 13 0.0          0.0          0.0          0.4498E 12 0.0          0.2145E 13 0.5984E 12 0.1186E 13
2    800 0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
3   3101 0.1026E 13 0.2181E 12 0.3323E 12 0.6077E 11 0.6559E 11 0.1465E 12 0.2102E 12 0.2817E 13 0.2930E 13 0.5806E 12
4   6801 0.2509E 13 0.1047E 13 0.8398E 12 0.2040E 12 0.1836E 12 0.4352E 12 0.8126E 12 0.1329E 13 0.6120E 12 0.1319E 13
5   6802 0.4166E 13 0.3325E 13 0.1597E 13 0.3693E 12 0.0          0.2055E 13 0.2308E 13 0.2751E 13 0.1522E 13 0.0

OIRECT ENERGY MATRIX (5 8Y 362)
            271          272          273          274          275          276          277          278          279          280
  COOE      5602         5603         5604         5701         5702         5703         5801         5802         5803         5804

1    700 0.0          0.5803E 13 0.1212E 13 0.0          0.3146E 12 0.1047E 13 0.3155E 12 0.4947E 12 0.0          0.2084E 13
2    800 0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
3   3101 0.9200E 11 0.4313E 13 0.1822E 14 0.1906E 13 0.3646E 13 0.7872E 13 0.2936E 12 0.8969E 11 0.1027E 12 0.4386E 12
4   6801 0.3570E 12 0.1860E 13 0.7395E 13 0.2309E 13 0.2302E 13 0.3352E 13 0.1506E 13 0.2074E 12 0.1326E 12 0.1180E 13
5   6802 0.9507E 12 0.2555E 13 0.2743E 13 0.1742E 13 0.1070E 13 0.3649E 13 0.1866E 13 0.4087E 12 0.6134E 11 0.1723E 13

DIRECT ENERGY MATRIX (5 8Y 362)
            281          282          283          284          285          286          287          288          289          290
  CODE      5805         5901         5902         5903         6001         6002         6003         6004         6101         6102

1    700 0.0          0.4850E 12 0.2225E 12 0.8272E 14 0.2659E 13 0.4105E 13 0.0          0.2394E 13 0.1635E 13 0.4890E 12
2    800 0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
3   3101 0.1250E 12 0.1256E 13 C.1808E 13 0.2542E 14 0.7659E 13 0.1216E 14 0.1649E 12 0.6191E 13 0.6879E 13 0.5765E 12
4   6801 0.2346E 12 0.5542E 12 0.3978E 12 0.3666E 14 0.7194E 13 0.7303E 13 0.3638E 12 0.5185E 13 0.3373E 13 0.2924E 12
5   6802 0.3645E 12 0.1123E 13 0.5976E 12 0.4833E 14 0.8574E 13 0.3381E 13 0.0          0.0          0.1958E 13 0.4822E 12

DIRECT ENERGY MATRIX (5 BY 362)
            291          292          293          294          295          296          297          298          299          300
  CODE      6103         6104         6105         6106         6107         6201         6202         6203         6204         6205

1    700 0.4776E 13 0.3566E 13 0.0          0.0          0.0          0.1436E 12 0.3766E 12 0.0          0.0          0.1819E 12
2    800 0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
3   3101 0.1098E 13 0.2678E 13 0.8634E 11 0.2229E 12 0.6972E 11 0.3861E 12 0.9132E 12 0.3484E 12 0.1194E 12 0.3051E 12
4   6801 0.3978E 12 0.9486E 12 0.2550E 12 0.1700E 12 0.1190E 12 0.6018E 12 0.1207E 13 0.6018E 12 0.2108E 12 0.5372E 12
5   6802 0.3514E 12 0.2675E 13 0.8755E 12 0.3703E 12 0.2183E 12 0.1292E 13 0.1523E 13 0.1029E 13 0.3211E 12 0.0
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DIRECT ENERGY MATRIX (5 BY 362)
           301        302        303        304        305        306        307        308        309        310
  CODE    6206       6207       6301       6302       6303       6401       6402       6403       6404       6405

1    700 0.0        0.8151E 12 0.0        0.0        0.1324E 14 0.3267E 12 0.7046E 12 0.1547E 12 0.5000E 12 0.3791E 12
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.6895E 11 0.2146E 12 0.1242E 12 0.1471E 12 0.1049E 14 0.4287E 12 0.1994E 12 0.6489E 13 0.4107E 13 0.1666E 13
4   6801 0.9860E 11 0.3808E 12 0.1802E 12 0.4794E 12 0.1353E 13 0.8568E 12 0.2618E 12 0.1006E 13 0.6664E 12 0.4998E 12
5   6802 0.1538E 12 0.1797E 12 0.2405E 12 0.9913E 12 0.2109E 13 0.5705E 12 0.5281E 12 0.9527E 12 0.9964E 12 0.5286E 12

DIRECT ENERGY MATRIX (5 BY 362)
           311        312        313        314        315        316        317        318        319        320
  CODE    6406       6407       6408       6409       6410       6411       6412       6501       6502       6503

1    700 0.0        0.0        0.1002E 12 0.2542E 13 0.6641E 12 0.0        0.9366E 12 0.3977E 14 0.0        0.0
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.2557E 11 0.1582E 12 0.1938E 12 0.1176E 12 0.2269E 12 0.3913E 13 0.7139E 13 0.5700E 15 0.2060E 15 0.8268E 15
4   6801 0.5780E 11 0.5644E 12 0.2924E 12 0.4930E 12 0.1870E 12 0.5202E 12 0.6018E 12 0.6930E 13 0.2447E 13 0.6968E 13
5   6802 0.0        0.3830E 12 0.2153E 12 0.3430E 12 0.3881E 12 0.1280E 13 0.5951E 12 0.1999E 14 0.3167E 13 0.1735E 14

DIRECT ENERGY MATRIX (5 BY 362)
           321        322        323        324        325        326        327        328        329        330
  CODE    6504       6505       6506       6507       6600       6700       6801       6802       6803       6901

1    700 0.1756E 14 0.0        0.0        0.0        0.0        0.0       (0.5490E  16)0.1207E 14 0.1671E 14 0.0
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0       (0. 1339E 17)0.0        0.0
3   3101 0.5631E 15 0.5602E 15 0.4947E 12 0.1250E 14 0.7353E 14 0.3368E 13(0.5430E  15)0.3966E 14 0.8583E 14 0.4705E 15
4   6801 0.1795E 13 0.1053E 13 0.3726E 13 0.8747E 12 0.1611E 14 0.2579E 13 0.3035E 15 0.1606E 13 0.4579E 13 0.4418E 14
5   6802 0.4536E 13 0.7393E 13 0.4848E 15 0.1784E 13 0.3377E 14 0.5285E 13(0. 2220E  16)0.8239E 15 0.3268E 14 0.9778E 14

DIRECT ENERGY MATRIX (5 BY 362)
           331        332        333        334        335        336        337        338        339        340
  CODE    6902       7001       7002       7003       7004       7005       7101       7102       7201       7202

1    700 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.6825E 15 0.2784E 14 0.2117E 14 0.1045E 14 0.3908E 14 0.1379E 14 0.0        0.3657E 14 0.3570E 14 0.8221E 14
4   6801 0.1595E 15 0.1554E 14 0.6889E 13 0.4042E 13 0.2276E 14 0.6168E 13 0.0        0.1591E 14 0.6187E 13 0.8543E 13
5   6802 0.3750E 15 0.3668E 14 0.1632E 14 0.9757E 13 0.5435E 14 0.1467E 14 0.0        0.5428E 14 0.3725E 14 0.2066E 14

DIRECT ENERGY MATRIX (5 BY 362)
           341        342        343        344        345        346        347        348        349        350
  CODE    7203       7301       7302       7303       7500       7601       7602       7701       7702       7703

1    700 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.8844E 13 0.5102E 14 0.8388E 13 0.5482E 14 0.5450E 14 0.6661E 13 0.1046E 14 0.3194E 14 0.4462E 14 0.2172E 14
4   6801 0.7802E 13 0.2078E 14 0.7255E 12 0.1591E 14 0.7020E 13 0.2198E 13 0.6141E 13 0.4651E 13 0.1795E 14 0.1600E 14
5   6802 0.1483E 14 0.5196E 14 0.7217E 13 0.4898E 14 0.1657E 14 0.5365E 13 0.1189E 14 0.2182E 14 0.3522E 14 0.3415E 14

DIRECT ENERGY MATRIX (5 BY 362)
           351        352        353        354        355        356        357        358        359        360
  CODE    7704       7705       7801       7802       7804       7901       7902       7903       8001       8002

1    700 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
2    800 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
3   3101 0.4376E 14 0.5472E 14 0.6742E 13 0.2184E 12 0.8194E 11 0.9678E 13 0.6559E 14 0.1715E 14 0.0        0.0
4   6801 0.2155E 14 0.3692E 14 0.2961E 13 0.0        0.1863E 13 0.9004E 13 0.0        0.2469E 14 0.0        0.0
5   6802 0.4812E 14 0.3949E 14 0.4621E 13 0.5174E 12 0.1240E 14 0.5946E 13 0.0        0.1761E 15 0.0        0.0
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DIRECT ENERGY MATRIX (5 BY 362)
           361          362
  CODE    8100         8200

1    700 0.0           0.0
2    800 0.0           0.0
3   3101 0.0           0.0
4   6801 0.0           0.0
5   6802 0.0           0.0
```

Table 3. Direct and total energy coefficients for the five energy sectors. Direct coefficients in parentheses represent sales from primary to secondary energy producers, which receive special treatment in computation, as discussed in Section II C. See Section IV B for general explanation.

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                      1          2          3          4          5          6          7          8          9         10
         CODE        101        102        103        201        202        203        204        205        206        207
DIRBTU
  1    700      0.0        5.7649E-03 0.0        0.0        0.0        0.0        0.0        0.0        0.0        2.1822E-03
  2    800      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101      5.4684E-03 5.7924E-03 3.3146E-03 1.8564E-02 2.9741E-02 2.3157E-02 1.8508E-02 1.2514E-02 2.8766E-02 1.6197E-02
  4   6801      1.5118E-03 8.3489E-04 6.6908E-04 2.0321E-03 5.6312E-04 9.3010E-04 1.0353E-03 7.7398E-04 9.0785E-04 5.2780E-04
  5   6802      0.0        4.7125E-03 0.0        0.0        0.0        0.0        0.0        0.0        0.0        8.8795E-03
INVBTU
  1    700      1.0907E-02 1.9801E-02 9.1905E-03 1.2581E-02 1.0002E-02 7.5577E-03 8.3242E-03 7.8468E-03 8.2492E-03 6.5271E-03
  2    800      4.3341E-02 5.2928E-02 4.0432E-02 4.5329E-02 5.7264E-02 4.2939E-02 2.8694E-02 3.1180E-02 5.3155E-02 3.8232E-02
  3   3101      3.3528E-02 3.4722E-02 3.1385E-02 3.3779E-02 4.6083E-02 3.5170E-02 2.0836E-02 2.3406E-02 4.4727E-02 2.4175E-02
  4   6801      3.9420E-03 4.0809E-03 3.1841E-03 4.5632E-03 3.1094E-03 2.6919E-03 2.7807E-03 2.5884E-03 2.8771E-03 1.4662E-03
  5   6802      1.1862E-02 2.0460E-02 1.0894E-02 1.3571E-02 1.3934E-02 9.8648E-03 9.1414E-03 9.2077E-03 1.1013E-02 1.5673E-02
TOINBU
  1    700      5.0152E-02 6.8490E-02 4.6315E-02 5.3171E-02 6.4035E-02 4.7700E-02 3.4130E-02 3.6330E-02 5.8419E-02 4.3236E-02
TOINBP
  1    700      5.6601E-02 7.5166E-02 5.1524E-02 6.0636E-02 6.9122E-02 5.2104E-02 3.8679E-02 4.0573E-02 6.3122E-02 4.5634E-02
PCGDOB
  1    700      1.6553E-04 2.3535E-03 3.8194E-04 8.7211E-04 1.2286E-03 1.5362E-04 7.0241E-04 1.0592E-03 3.7190E-04 2.1443E-04
  2    800      2.3994E-04 2.2948E-03 6.1292E-04 1.1461E-03 2.5659E-03 3.1837E-04 8.8321E-04 1.5353E-03 8.7411E-04 4.5815E-04
  3   3101      2.8749E-04 2.3317E-03 7.3691E-04 1.3229E-03 3.1983E-03 4.0390E-04 9.9333E-04 1.7851E-03 1.1352E-03 4.4872E-04
  4   6801      2.3881E-04 1.9362E-03 5.2820E-04 1.2626E-03 1.5247E-03 2.1842E-04 9.3662E-04 1.3947E-03 5.1775E-04 1.9227E-04
  5   6802      1.6289E-04 2.2004E-03 4.0962E-04 8.5117E-04 1.5487E-03 1.8143E-04 6.9793E-04 1.1246E-03 4.4921E-04 4.6587E-04
TOPCGU
  1    700      2.1774E-04 2.3565E-03 5.5402E-04 1.0496E-03 2.2926E-03 2.8122E-04 8.2237E-04 1.4097E-03 7.6721E-04 4.1771E-04
TOPCGP
  1    700      2.6014E-04 2.2702E-03 5.7854E-04 1.0802E-03 2.1721E-03 3.1234E-04 8.5133E-04 1.4025E-03 7.5958E-04 4.2645E-04
PCGTOT
  1    700      6.8473E-01 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2    800      5.8060E-01 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101      5.0470E-01 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4   6801      6.7375E-01 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5   6802      6.6048E-01 0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GDOBTU
  1    700      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GDODOL
  1    700      5.7774E 06 3.7086E 06 1.7198E 07 3.0932E 06 1.3869E 07 1.4905E 06 2.0991E 06 3.2854E 06 2.2907E 06 1.1380E 06
TFDDOL
  1    700      1.8950E 05 1.4841E 06 5.1890E 05 8.6550E 05 1.5338E 06 2.5380E 05 1.0536E 06 1.6855E 06 5.6290E 05 4.1020E 05
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                   11         12         13         14         15         16         17         18         19         20
        CODE      300        400        500        601        602        700        800        900       1000       1101
DIRBTU
  1   700     0.0        0.0        2.6261E-02 4.9647E-03 3.3450E-03 3.5205E-02 0.0        5.1642E-03 6.9252E-03 0.0
  2   800     0.0        0.0        0.0        0.0        0.0        0.0        7.1415E-02 0.0        0.0        0.0
  3  3101     1.5388E-03 4.2574E-03 1.2825E-02 5.3607E-03 5.0067E-03 6.9169E-03 2.7186E-03 1.8281E-02 1.7522E-02 6.0062E-03
  4  6801     1.3026E-05 6.4509E-05 5.9347E-03 1.0670E-02 6.1652E-03 5.9019E-03 1.6946E-03 5.0846E-03 8.1418E-03 3.8606E-04
  5  6802     7.7163E-06 3.9338E-05 1.2989E-02 1.4161E-02 9.8760E-03 3.3963E-04 8.8188E-03 1.3549E-02 9.8283E-02 7.4349E-04
INVBTU
  1   700     6.5718E-03 1.2311E-02 4.6813E-02 4.6840E-02 2.6622E-02 6.3777E-02 7.2129E-09 2.6978E-02 3.2002E-02 1.8668E-02
  2   800     2.1742E-02 3.5571E-02 5.4285E-02 6.1013E-02 4.1330E-02 3.0188E-02 9.9660E-02 6.2668E-02 1.4993E-01 3.9290E-02
  3  3101     1.4910E-02 2.6078E-02 3.1065E-02 1.9517E-02 1.6803E-02 1.7489E-02 1.1455E-02 3.3650E-02 3.3010E-02 2.2683E-02
  4  6801     1.8148E-03 2.6225E-03 7.9434E-03 1.6783E-02 9.3875E-03 8.9226E-03 2.8096E-03 7.6606E-03 1.0438E-02 3.8006E-03
  5  6802     7.2657E-03 1.1224E-02 2.5785E-02 4.2813E-02 2.5882E-02 1.3217E-02 1.5869E-02 3.1127E-02 1.2100E-01 1.8552E-02
TCINBU
  1   700     2.6428E-02 4.5157E-02 9.2846E-02 9.0419E-02 5.8200E-02 8.4697E-02 1.0395E-01 8.1688E-02 1.7108E-01 5.4010E-02
TCINBP
  1   700     2.9397E-02 4.9448E-02 1.0584E-01 1.1788E-01 7.3558E-02 9.9294E-02 1.0855E-01 9.4221E-02 1.8816E-01 6.0227E-02
PCGOO8
  1   700     1.7911E-C4 9.3669E-06 2.7070E-04-1.0504E-05 5.1598E-04 2.6551E-03 1.5771E-05 5.6393E-05 2.2529E-04 4.0441E-02
  2   800     2.1615E-04 9.8721E-06 1.1450E-04-4.9909E-06 2.9220E-04 4.5842E-04 7.9483E-05 4.7784E-05 3.8500E-04 3.1048E-02
  3  3101     2.2959E-04 1.1210E-05 1.0149E-04-2.4727E-06 1.8399E-04 4.1135E-04 1.4150E-05 3.9741E-05 1.3129E-04 2.7762E-02
  4  6801     1.9743E-04 7.9647E-06 1.8335E-04-1.5023E-05 7.2627E-04 1.4827E-03 2.4521E-05 6.3920E-05 2.9333E-04 3.2865E-02
  5  6802     1.7917E-04 7.7267E-06 1.3491E-04-8.6867E-06 4.5387E-04 4.9784E-04 3.1394E-05 5.8870E-05 7.7070E-04 3.6363E-02
TOPCGU
  1   700     2.0733E-04 9.9551E-06 1.5291E-04-5.4115E-06 3.0597E-04 9.9175E-04 6.7121E-05 4.8383E-05 3.4834E-04 3.3643E-02
TOPCGP
  1   700     2.4686E-04 5.7909E-05 1.9879E-04 4.2331E-05 3.8702E-04 1.0539E-03 1.0860E-04 9.6706E-05 3.7770E-04 3.2316E-02
PCGTOT
  1   700     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2   800     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3  3101     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4  6801     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5  6802     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GOOBTU
  1   700     0.0        0.0        0.0        0.0        0.0        1.2486E 07 3.4230E 07 0.0        0.0        0.0
GOOOOL
  1   700     1.7510E C6 1.7719E 06 1.4294E 06 6.9720E 05 8.2520E 05 2.6368E 06 1.2265E 07 2.0241E 06 6.9640E 05 2.7049E 07
TFOOOL
  1   700     3.4030E 05 9.5000E 03 7.2200E 04-2.8000E 03 2.4200E 05 5.1980E 05 2.7300E 04 2.6100E 04 8.7900E 04 2.7049E 07
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                   21           22           23           24           25           26           27           28           29           30
        CODE      1102         1103         1104         1105         1201         1202         1301         1302         1303         1304
DIRBTU
  1    700      0.0          0.0          0.0          0.0          0.0          0.0          7.4093E-04 6.0230E-03 1.8038E-03 0.0
  2    800      0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  3   3101      5.8783E-03 5.8873E-03 2.6241E-02 8.1151E-03 6.5867E-03 2.4151E-02 6.7707E-04 7.3904E-04 4.3289E-04 4.9906E-04
  4   6801      3.5259E-04 2.0035E-04 1.6792E-04 2.0016E-04 4.4465E-04 4.6267E-04 8.7809E-04 1.8269E-03 8.7846E-04 1.1564E-03
  5   6802      6.8372E-C4 3.8914E-04 3.5949E-04 3.8854E-04 8.6634E-04 8.9343E-04 9.1462E-04 6.2383E-04 1.2322E-04 2.2344E-04
INVBTU
  1    700      2.2781E-02 2.9752E-02 2.8097E-02 2.4645E-02 1.4551E-02 1.2932E-02 1.1969E-02 3.5064E-02 4.1149E-02 1.3318E-02
  2    80)      4.1150E-02 4.3267E-02 6.8253E-02 4.4566E-02 4.0751E-02 5.2614E-02 1.73[illegible]E-02 3.0348E-02 4.3615E-02 2.0368E-02
  3   3101      2.2987E-02 2.4174E-02 5.0658E-02 2.5260E-02 2.7964E-02 4.3500E-02 8.1956E-03 1.2020E-02 1.7986E-02 9.4831E-03
  4   6801      4.0842E-03 4.2108E-03 3.6112E-03 3.4416E-03 3.3859E-03 2.6313E-03 3.7829E-03 7.4059E-03 9.0822E-03 4.2038E-03
  5   6802      2.0043E-02 2.0985E-02 2.1070E-02 2.0154E-02 1.5083E-02 1.2821E-02 9.7846E-03 1.9305E-02 2.7132E-02 1.1663E-02
TCINBU
  1    700      5.9689E-02 6.8645E-02 9.2599E-02 6.5636E-02 5.1785E-02 6.2812E-02 2.5428E-02 5.7719E-02 7.5329E-02 2.9319E-02
TCINBP
  1    700      6.6371E-02 7.5534E-02 9.8507E-02 7.1266E-02 5.7324E-02 6.7117E-02 3.1617E-02 6.9835E-02 9.C188E-02 3.6197E-02
PCGDOB
  1    700      3.2048E-02 1.7083E-02 1.5619E-02 1.3412E-02 1.7597E-04 4.9433E-03 3.8173E-03 9.8991E-04 1.4244E-03 1.6938E-04
  2    800      2.1116E-02 9.0618E-03 1.3840E-02 8.8467E-03 1.7977E-04 7.3361E-03 2.0231E-03 3.1252E-04 5.5070E-04 9.4492E-05
  3   3101      1.8270E-02 7.8417E-03 1.5910E-02 7.7666E-03 1.9106E-04 9.3945E-03 1.4768E-03 1.9171E-04 3.5174E-04 6.8141E-05
  4   6801      2.2934E-02 9.6506E-03 8.0133E-03 7.4762E-03 1.6345E-04 4.0150E-03 4.8160E-03 8.3458E-04 1.2549E-03 2.1342E-04
  5   6802      2.5511E-02 1.0901E-02 1.0598E-02 9.9235E-03 1.6504E-04 4.4341E-03 2.8236E-03 4.9313E-04 8.4974E-04 1.3421E-04
TOPCGU
  1    700      2.4174E-02 1.1397E-02 1.5091E-02 1.0386E-02 1.8063E-04 7.0264E-03 2.2180E-03 4.5162E-04 7.2630E-04 1.0234E-04
TOPCGP
  1    700      2.3162E-02 1.0823E-02 1.3814E-02 9.7284E-03 2.2043E-04 6.4876E-03 2.4549E-03 5.2314E-04 8.0260E-04 1.5865E-04
PCGTOT
  1    700      0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  2    800      0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  3   3101      0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  4   6801      0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  5   6802      0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0



GCOBTU
  1    700      0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
GCODOL
  1    700      1.7565E 07 7.1690E 06 6.9410E 06 6.7950E 06 6.6150E 06 1.3179E 07 4.1978E 06 5.6530E 05 5.0350E 05 2.2800E 05
TFDDOL
  1    700      1.7565E 07 7.1690E 06 6.9410E 06 6.7950E 06 1.5100E 05 4.7728E 06 3.9823E 06 3.5250E 05 4.3220E 05 1.5880E 05
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                  31         32         33         34         35         36         37         38         39         40
      CODE       1305       1306       1307       1401       1402       1403       1404       1405       1406       1407
DIRBTU
  1    700    5.3321E-03 7.4443E-03 2.8156E-03 1.1104E-03 5.1657E-03 2.2975E-03 1.2829E-02 4.9082E-04 1.1920E-03 2.0298E-04
  2    800    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101    4.6446E-04 4.3180E-04 8.1502E-04 1.2235E-03 3.2410E-03 2.9486E-03 2.3145E-03 2.9852E-03 4.4126E-03 3.7297E-04
  4   6801    1.7169E-03 1.8124E-03 3.2751E-03 5.0282E-04 7.5047E-04 7.1370E-04 7.9047E-04 1.8504E-03 9.8765E-04 3.8395E-04
  5   6802    8.1332E-03 5.6827E-03 3.2536E-03 2.2163E-03 9.0292E-03 3.0741E-03 7.8097E-03 1.6322E-03 2.9627E-03 8.4493E-04
INVBTU
  1    700    2.5221E-02 2.3859E-02 2.8506E-02 1.2913E-02 2.0304E-02 1.6242E-02 3.1725E-02 1.7785E-02 1.4602E-02 1.4735E-02
  2    800    3.1541E-02 4.3658E-02 2.9304E-02 4.1842E-02 5.4183E-02 4.3395E-02 4.8561E-02 3.8467E-02 4.2934E-02 2.6154E-02
  3   3101    1.1904E-02 1.4155E-02 1.1493E-02 2.9318E-02 3.2382E-02 2.8288E-02 2.7015E-02 2.3563E-02 2.8746E-02 1.6002E-02
  4   6801    4.5230E-03 5.6207E-03 7.1922E-03 3.5319E-03 4.6496E-03 4.4328E-03 4.4675E-03 4.9103E-03 4.2470E-03 2.5984E-03
  5   6802    2.0460E-02 2.7130E-02 1.8750E-02 1.4412E-02 2.4076E-02 1.7016E-02 2.3575E-02 1.6502E-02 1.6018E-02 1.0953E-02
TCINBU
  1    700    5.2064E-02 6.1678E-02 5.0340E-02 5.1086E-02 6.9658E-02 5.5023E-02 7.5645E-02 5.1151E-02 5.3125E-02 3.8189E-02
TCINBP
  1    700    5.9463E-02 7.0873E-02 6.2106E-02 5.6864E-02 7.7264E-02 6.2275E-02 8.2954E-02 5.9185E-02 6.0073E-02 4.2440E-02
PCGDOB
  1    700    3.2925E-04 3.7510E-04 8.4199E-04 1.4914E-02 1.2030E-03 1.0050E-03 1.5344E-03 1.6853E-03 6.2716E-03 4.2567E-04
  2    800    1.5019E-04 2.5036E-04 3.1573E-04 1.7627E-02 1.1710E-03 9.7924E-04 8.5674E-04 1.3297E-03 6.7265E-03 2.7559E-04
  3   3101    8.7798E-05 1.2573E-04 1.9179E-04 1.9130E-02 1.0840E-03 9.8895E-04 7.3821E-04 1.2615E-03 6.9755E-03 2.6117E-04
  4   6801    2.3569E-04 3.5273E-04 8.4798E-04 1.6282E-02 1.0997E-03 1.0949E-03 8.6290E-04 1.8574E-03 7.2812E-03 2.9963E-04
  5   6802    2.4166E-04 3.8592E-04 5.0108E-04 1.5060E-02 1.2907E-03 9.5265E-04 1.0317E-03 1.4148E-03 6.2248E-03 2.8629E-04
TOPCGU
  1    700    1.9342E-04 2.7521E-04 4.0821E-04 1.6978E-02 1.1894E-03 9.7275E-04 1.0594E-03 1.3715E-03 6.5217E-03 3.1768E-04
TOPCGP
  1    700    2.3898E-04 3.2134E-04 4.8739E-04 1.6300E-02 1.1828E-03 9.9676E-04 1.0465E-03 1.4185E-03 6.3955E-03 3.5211E-04
PCGTOT
  1    700    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2    800    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4   6801    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5   6802    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GCOBTU
  1    700    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GOODOL
  1    700    1.8270E 05 2.1310E 05 4.2470E 05 1.8526E 07 1.1539E 06 1.2171E 06 1.2962E 06 1.3041E 06 7.4325E 06 4.3140E 05
TFDOOL
  1    700    1.6300E 05 1.9630E 05 3.6880E 05 1.4420E 07 7.3980E 05 7.7260E 05 6.0390E 05 1.1832E 06 5.3628E 06 3.6070E 05
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                    41         42         43         44         45         46         47         48         49         50
      CODE         1408       1409       1410       1411       1412       1413       1414       1415       1416       1417
DIRBTU
  1    700      7.0722E-03 2.2860E-03 9.4823E-04 8.2691E-04 0.0        1.7604E-04 1.5615E-03 4.2795E-04 0.0        5.9048E-02
  2    800      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101      5.1251E-03 3.2645E-03 2.5089E-04 3.5064E-04 3.8312E-04 5.4800E-03 8.5647E-04 1.4872E-03 4.4438E-04 1.9346E-03
  4   6801      5.4133E-04 5.8255E-04 8.5220E-04 5.7414E-04 7.5495E-04 1.6454E-03 1.3201E-03 8.3374E-04 6.5607E-04 9.6817E-04
  5   6802      3.1403E-03 6.0888E-03 1.3204E-02 1.8673E-03 5.7536E-04 5.4523E-03 1.3564E-03 3.4662E-03 2.3106E-03 1.3171E-02
INVBTU
  1    700      2.6583E-02 2.5065E-02 1.4757E-02 2.0871E-02 1.1503E-02 1.9917E-02 1.5879E-02 1.8378E-02 1.1157E-02 7.2232E-02
  2    800      4.2288E-02 4.4937E-02 4.6490E-02 4.9546E-02 2.7155E-02 4.5300E-02 4.5828E-02 5.1587E-02 5.1133E-02 4.8476E-02
  3   3101      2.3195E-02 2.2900E-02 1.8493E-02 2.3172E-02 1.7452E-02 2.4901E-02 3.2559E-02 3.2601E-02 3.8319E-02 2.5929E-02
  4   6801      3.6059E-03 3.7630E-03 3.7584E-03 4.5066E-03 2.9517E-03 5.8137E-03 4.1208E-03 4.6238E-03 3.5548E-03 2.9166E-03
  5   6802      2.1015E-02 2.3912E-02 2.9623E-02 2.8118E-02 1.0569E-02 2.2416E-02 1.5407E-02 2.1119E-02 1.5263E-02 2.4101E-02
TGINBU
  1    700      6.5125E-02 6.6093E-02 5.7342E-02 6.5735E-02 3.5591E-02 5.9177E-02 5.7426E-02 6.5161E-02 5.8598E-02 1.1768E-01
TCINBP
  1    700      7.1024E-02 7.2250E-02 6.3491E-02 7.3108E-02 4.0420E-02 6.8688E-02 6.4168E-02 7.2726E-02 6.4414E-02 1.2245E-01
PCGDOB
  1    700      1.9925E-03 4.9667E-03 3.0504E-04 9.5561E-04 3.3063E-04 2.2604E-03 1.8685E-03 8.7681E-04 2.8488E-04 1.8396E-04
  2    800      1.1562E-03 3.2480E-03 3.5054E-04 8.2750E-04 2.8471E-04 1.8754E-03 1.9671E-03 8.9776E-04 4.7623E-04 4.5035E-05
  3   3101      9.8227E-04 2.5637E-03 2.1598E-04 5.9943E-04 2.8342E-04 1.5967E-03 2.1647E-03 8.7875E-04 5.5277E-04 3.7310E-05
  4   6801      1.0789E-03 2.9764E-03 3.1012E-04 8.2366E-04 3.3867E-04 2.6338E-03 1.9357E-03 8.8057E-04 3.6230E-04 2.9651E-05
  5   6802      1.4252E-03 4.2870E-03 5.5404E-04 1.1648E-03 2.7487E-04 2.3018E-03 1.6404E-03 9.1164E-04 3.5259E-04 5.5537E-05
TOPCGU
  1    700      1.4167E-03 3.7973E-03 3.4186E-04 8.6643E-04 2.9186E-04 1.8977E-03 1.9414E-03 8.9358E-04 4.3281E-04 8.8627E-05
TOPCGP
  1    700      1.3752E-03 3.6134E-03 3.7392E-04 8.7715E-04 3.3411E-04 1.9508E-03 1.9147E-03 9.0640E-04 4.5729E-04 1.2755E-04
PCGTOT
  1    700      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2    800      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4   6801      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5   6802      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0




GDOBTU
  1    700      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GOODCL
  1    700      1.2005E 06 2.9080E 06 4.7370E 05 7.6830E 05 3.8890E 05 1.6865E 06 3.3171E 06 4.4479E 06 4.2210E 05 6.7810E 05
TFDDCL
  1    700      9.3590E 05 2.4741E 06 2.5810E 05 5.7170E 05 3.5890E 05 1.4171E 06 1.4693E 06 5.9570E 05 3.1880E 05 3.1800E 04
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                     51         52         53         54         55         56         57         58         59         60
       CODE         1418       1419       1420       1421       1422       1423       1424       1425       1426       1427
DIRBTU
  1     700     1.9249E-04 1.4248E-02 2.4088E-03 4.5261E-03 1.5391E-04 0.0        0.0        7.7574E-03 1.2613E-03 1.0873E-02
  2     800     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3    3101     5.1207E-03 5.4247E-03 2.2527E-03 3.2018E-03 4.1327E-03 2.7553E-03 6.8317E-04 1.8373E-03 2.9854E-04 1.0925E-02
  4    6801     6.6956E-04 2.7215E-04 9.8526E-04 5.3415E-04 5.9781E-04 2.2252E-04 4.3174E-03 1.3762E-03 1.6100E-03 1.5125E-03
  5    6802     4.3655E-03 2.0363E-02 1.6985E-03 3.2748E-03 1.5253E-03 3.0716E-04 8.8458E-03 6.8012E-03 6.2596E-03 1.6453E-02
INVBTU
  1     700     1.2470E-C2 2.5441E-02 1.5884E-C2 1.5879E-02 1.5442E-02 1.4850E-02 2.1656E-02 1.9239E-02 1.3002E-02 2.8762E-02
  2     800     3.5951E-02 5.3121E-02 3.3034E-02 2.5827E-02 3.7804E-02 3.6397E-02 6.2171E-02 6.1241E-02 4.1746E-02 7.0698E-02
  3    3101     2.0920E-02 2.0790E-02 1.7978E-02 1.3132E-02 1.8935E-02 1.8262E-02 3.4231E-02 4.4686E-02 2.6132E-02 3.5618E-02
  4    6801     2.9690E-03 1.4873E-03 3.3348E-03 2.3165E-03 3.1889E-03 2.7071E-03 9.2885E-03 4.3621E-03 3.9412E-03 4.6293E-03
  5    6802     1.6419E-02 3.4733E-02 1.6144E-02 1.3840E-02 2.0338E-02 1.8919E-02 3.0610E-02 1.9552E-02 1.7571E-02 3.7158E-02
TOINBU
  1     700     4.5336E-02 7.7017E-02 4.9454E-02 3.9300E-02 4.9933E-02 4.8435E-02 7.4218E-02 7.5948E-02 5.0654E-02 9.4651E-02
TCINBP
  1     700     5.0194E-02 7.9450E-02 5.4909E-02 4.3090E-02 5.5150E-02 5.2864E-02 8.9414E-02 8.3085E-02 5.7102E-02 1.0222E-01
PCGDOB
  1     700     5.6163E-03 2.0027E-03 2.9267E-03 7.0945E-03 2.5354E-03 3.2100E-04 1.1051E-04 3.2805E-04-3.54C4E-06 3.1375E-04
  2     800     5.9064E-03 1.5253E-03 1.7736E-03 4.2091E-03 2.2641E-03 2.8699E-04 1.1551E-04 3.8090E-04-4.1466E-06 2.8130E-04
  3    3101     5.3235E-03 9.2462E-04 1.4951E-03 3.3148E-03 1.7565E-03 2.2303E-04 9.8511E-05 4.3048E-04-4.0202E-06 2.1951E-04
  4    6801     5.3379E-C3 4.6736E-04 1.9593E-03 4.1313E-03 2.0900E-03 2.3358E-04 1.8886E-04 2.9689E-04-4.2839E-C6 2.0157E-04
  5    6802     6.6908E-03 2.4738E-03 2.1499E-03 5.5947E-03 3.0214E-03 3.7001E-04 1.4107E-04 3.0163E-04-4.3291E-06 3.6673E-04
TCPCGU
  1     700     5.8893E-03 1.7988E-03 2.0968E-03 5.0847E-03 2.3670E-03 3.0377E-04 1.0499E-04 3.7537E-04-3.9477E-06 3.0085E-04
TCPCGP
  1     700     5.6533E-03 1.6379E-03 2.0503E-03 4.8373E-03 2.2953E-03 3.3324E-04 1.5833E-04 4.0122E-04 4.4715E-05 3.2737E-04
PCGTOT
  1     700     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2     800     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3    3101     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4    6801     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5    6802     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GOOBTU
  1     700     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GDOOOL
  1     700     6.0761E 06 3.2500E 06 2.2724E 06 6.8247E 06 2.2448E 06 8.7990E 05 5.6950E 05 1.4706E 06 3.2640E 05 7.2760E 05
TFOOOL
  1     700     5.6237E 06 9.8290E 05 1.8378E 06 5.5785E 06 2.0501E 06 2.6990E 05 6.3600E 04 2.1290E 05-3.4000E 03 1.3620E 05
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                   61          62          63          64          65          66          67          68          69          70
      CODE        1428        1429        1430        1431        1432        1501        1502        1601        1602        1603
OIR8TU
  1   700     0.0         5.9986E-03  0.0         2.2177E-03  2.7761E-03  1.2072E-03  9.2730E-04  5.7067E-03  7.5579E-04  1.8299E-03
  2   800     0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  3  3101     4.2261E-04  6.2552E-03  3.0307E-03  5.6438E-04  1.9448E-03  2.2562E-04  8.4650E-04  4.7307E-03  3.6580E-04  1.8204E-03
  4  6801     3.3044E-04  1.0146E-03  1.8437E-02  1.2455E-03  6.2741E-04  2.1536E-04  1.6437E-04  2.6685E-03  1.3057E-03  3.7021E-03
  5  6802     1.8262E-03  8.6377E-03  0.0         2.8269E-03  4.9105E-03  2.5523E-04  2.0138E-04  3.2614E-03  1.3193E-03  1.1412E-03
INV8TU
  1   700     8.1099E-03  2.8310E-02  4.3211E-02  1.9580E-02  1.7122E-02  7.8600E-03  7.4327E-03  3.6305E-02  2.7453E-02  3.1571E-02
  2   800     1.5343E-02  6.2589E-02  3.8163E-02  3.7942E-02  3.9566E-02  1.5948E-02  3.3376E-02  4.9757E-02  3.6357E-02  4.5955E-02
  3  3101     8.2388E-03  3.5807E-02  1.6276E-02  2.1857E-02  1.9731E-02  1.0381E-02  2.7171E-02  2.6344E-02  1.7190E-02  2.4085E-02
  4  6801     1.4853E-03  5.5424E-03  2.1992E-02  4.4365E-03  3.3669E-03  1.7256E-03  2.2465E-03  8.5311E-03  6.3495E-03  9.0899E-03
  5  6802     7.7695E-03  2.9693E-02  2.3104E-02  1.7525E-02  2.1103E-02  6.2357E-03  7.8944E-03  2.5577E-02  2.0571E-02  2.3863E-02
TOINBU
  1   700     2.1910E-02  8.5141E-02  5.8529E-02  5.2913E-02  5.3190E-02  2.2015E-02  3.8475E-02  7.7199E-02  5.7215E-02  6.8C83E-02
TCINBP
  1   700     2.4340E-02  9.4209E-02  9.4507E-02  6.0171E-02  5.8698E-02  2.4838E-02  4.2151E-02  9.1156E-02  6.76C2E-02  8.2955E-02
PCGOD8
  1   700     1.0016E-03  1.7633E-03  1.3324E-04  3.0233E-04  2.4405E-03  3.1995E-03  2.3329E-04  2.5413E-03  8.2232E-05  1.2516E-04
  2   800     6.9124E-04  1.4220E-03  4.2923E-05  2.1371E-04  2.0571E-03  2.3680E-03  3.8213E-04  1.2705E-03  3.9725E-05  6.6456E-05
  3  3101     5.7489E-04  1.2600E-03  2.8353E-05  1.9068E-04  1.5889E-03  2.3875E-03  4.8182E-04  1.0419E-03  2.9090E-05  5.3945E-05
  4  6801     7.3224E-04  1.3780E-03  2.7068E-04  2.7345E-04  1.9156E-03  2.8039E-03  2.8146E-04  2.3837E-03  7.5918E-05  1.4385E-04
  5  6802     8.6821E-04  1.6734E-03  6.4457E-05  2.4484E-04  2.7215E-03  2.2966E-03  2.2419E-04  1.6198E-03  5.5751E-05  8.5595E-05
TOPCGU
  1   700     7.7936E-04  1.5299E-03  4.2014E-05  2.3296E-04  2.1896E-03  2.5639E-03  3.4984E-04  1.5149E-03  4.8031E-05  7.4556E-05
TOPCGP
  1   700     7.9297E-04  1.5036E-03  1.1303E-04  2.7681E-04  2.1251E-03  2.5392E-03  3.7773E-04  1.5967E-03  9.7668E-05  1.2753E-04
PCGTOT
  1   700     0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  2   800     0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  3  3101     0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  4  6801     0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  5  6802     0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0



GCD8TU
  1   700     0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
GCOOOL
  1   700     1.8248E 06  1.4017E 06  1.1670E 05  2.2980E 05  2.1754E 06  5.2626E 06  2.1676E 06  1.0484E 07  3.7410E 05  2.3184E 06
TFCOOL
  1   700     1.5421E 06  7.7770E 05  3.8500E 04  1.9280E 05  1.7797E 06  5.0826E 06  3.9190E 05  8.7400E 05  3.7400E 04  4.9500E 04
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                   71          72          73          74          75          76         . 77          78          79          80
        COOE      1604        1701        1702        1703        1704        1705        1706        1707        1708        1709
OIRBTU
  1    700    9.4279E-03 3.2830E-03 2.4459E-03 0.0        5.2400E-03 0.0        2.4291E-03 5.6267E-04 0.0        3.4238E-03
  2    800    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101    5.2868E-04 2.5503E-04 3.7103E-04 4.5641E-04 3.9864E-04 3.5313E-04 7.9129E-03 3.5551E-04 2.2458E-04 2.1483E-03
  4   6801    3.1654E-03 8.1807E-04 1.6927E-03 1.1517E-03 1.3300E-03 2.1004E-03 1.2037E-03 3.0855E-03 8.4654E-04 2.0834E-03
  5   6802    1.4211E-03 3.0796E-03 3.7123E-03 0.0        2.1442E-03 0.0        3.0542E-03 1.3592E-03 1.7653E-03 1.4287E-03
INVBTU
  1    700    3.7353E-02 2.8969E-02 1.7976E-02 2.3917E-02 1.6175E-02 9.6259E-03 3.1929E-02 5.5800E-02 1.1256E-02 1.7411E-02
  2    800    4.2987E-02 4.6157E-02 3.3762E-02 2.8130E-02 2.4297E-02 2.1456E-02 5.5297E-02 6.4932E-02 3.1121E-02 2.9717E-02
  3   3101    2.1270E-02 2.2028E-02 1.8634E-02 1.4338E-02 1.3546E-02 1.5316E-02 3.0679E-02 2.8603E-02 2.0665E-02 1.7673E-02
  4   6801    9.3712E-03 7.0583E-03 4.8839E-03 4.7316E-03 3.8939E-03 3.8965E-03 7.7430E-03 1.0594E-02 3.5569E-03 4.8249E-03
  5   6802    2.3434E-02 2.5841E-02 1.6106E-02 1.4915E-02 1.1680E-02 7.3244E-03 2.7182E-02 3.9127E-02 1.1882E-02 1.3362E-02
TOINBU
  1    700    7.0606E-02 6.7793E-02 4.6665E-02 4.7132E-02 3.6427E-02 2.7036E-02 7.9182E-02 1.0973E-01 3.8682E-02 4.2116E-02
TOINBP
  1    700    8.5937E-02 7.9340E-02 5.4655E-02 5.4873E-02 4.2798E-02 3.3407E-02 9.1850E-02 1.2706E-01 4.4501E-02 5.0009E-02
PCGDOB
  1    700    8.6158E-05 2.3131E-03 8.7679E-05 2.9308E-05 2.9795E-06 2.3899E-06 5.2422E-05 1.9217E-05 3.7322E-05 1.6872E-05
  2    800    3.6168E-05 1.3444E-03 6.0067E-05 1.2574E-05 1.6326E-06 1.9431E-06 3.3117E-05 8.1568E-06 3.7640E-05 1.0505E-05
  3   3101    2.7718E-05 9.9377E-04 5.1348E-05 9.9265E-06 1.4097E-06 2.1484E-06 2.8458E-05 5.5653E-06 3.8712E-05 9.6760E-06
  4   6801    8.6282E-05 2.2497E-03 9.5087E-05 2.3144E-05 2.8632E-06 3.8596E-06 5.0746E-05 1.4563E-05 4.7076E-05 1.8664E-05
  5   6802    4.8905E-05 1.8669E-03 7.1076E-05 1.6536E-05 1.9467E-06 1.6453E-06 4.0379E-05 1.2192E-05 3.5647E-05 1.1716E-05
TOPCGU
  1    700    4.5008E-C5 1.5238E-03 6.4047E-05 1.6296E-05 1.8855E-06 1.8415E-06 3.6743E-05 1.0688E-05 3.6383E-05 1.1412E-05
TOPCGP
  1    700    9.6171E-05 1.5902E-03 1.1340E-04 6.4937E-05 5.0463E-05 5.0530E-05 8.5352E-05 5.9232E-05 8.4657E-05 6.0284E-05
PCGTOT
  1    700    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2    800    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4   6801    0.0        0.0        0.0        0.0        0,0        0.0        0.0        0.0        0.0        0.0
  5   6802    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GCOBTU
  1    700    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GOODOL
  1    700    2.1360E 05 1.1800E 06 1.4180E 05 6.6600E 04 1.7660E 05 1.1750E 05 5.0760E 05 4.0560E 05 4.4220E 05 2.2070E 05
TFDDOL
  1    700    2.8800E 04 9.5700E 05 6.0900E 04 1.5300E 04 2.3000E 03 3.1000E 03 2.0500E 04 4.3000E 03 4.1400E 04 1.2100E 04
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                   81            82            83            84            85            86            87            88            89            90
      CODE        1710          1801          1802          1803          1804          1901          1902          1903          2001          2002
DIRBTU
  1   700     0.0           2.8738E-03    8.9488E-04    1.5790E-03    1.8278E-04    0.0           8.2423E-04    3.5315E-04    0.0           4.9850E-04
  2   800     0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0
  3   3101    1.8778E-04    4.6326E-03    1.6262E-03    8.5941E-03    7.0001E-04    3.6809E-04    6.1824E-04    3.5388E-04    4.9915E-03    4.2343E-03
  4   6801    1.8680E-03    1.3487E-03    5.9079E-04    1.1283E-03    3.9066E-04    5.0702E-04    5.3489E-04    6.4878E-04    7.9354E-05    2.1576E-03
  5   6802    2.3016E-03    2;3591E-03    2.1808E-03    1.0588E-03    3.0834E-04    0.0           7.4819E-04    1.9927E-04    1.3782E-03    3.0140E-03
INVBTU
  1   700     1.4614E-02    2.1132E-02    1.9220E-02    3.3132E-02    1.7111E-02    2.3361E-02    2.9800E-02    1.9505E-02    6.7168E-03    9.4781E-03
  2   800     2.3925E-02    3.7307E-02    3.0876E-02    5.1408E-02    2.6210E-02    3.3003E-02    4.1871E-02    2.9509E-02    2.4206E-02    2.6217E-02
  3   3101    1.2512E-02    1.9742E-02    1.5791E-02    2.9458E-02    1.4472E-02    1.8028E-02    2.2160E-02    1.5774E-02    1.6832E-02    1.6692E-02
  4   6801    3.5258E-03    5.6390E-03    5.2054E-03    7.4844E-03    4.3443E-03    5.6970E-03    7.0328E-03    5.0564E-03    1.4817E-03    3.6230E-03
  5   6802    1.1695E-02    1.9338E-02    1.6443E-02    2.4633E-02    1.2903E-02    1.6407E-02    2.1474E-02    1.4897E-02    8.3174E-03    1.0680E-02
TCINBU
  1   700     3.4876E-02    5.2581E-02    4.4689E-02    7.6765E-02    3.8808E-02    5.0446E-02    6.4365E-02    4.3762E-02    2.9384E-02    3.1932E-02
TOINBP
  1   700     4.0645E-02    6.1806E-02    5.32C5E-02    8.9010E-02    4.5915E-02    5.9767E-02    7.5871E-02    5.2035E-02    3.18C8E-02    3.7859E-02
PCGDOB
  1   70J     4.6467E-05    1.3927E-03    1.7241E-05    5.0417E-05    1.8092E-02    4.8272E-04    2.5237E-03    4.9693E-04    7.0417E-05    8.4411E-05
  2   800     2.7748E-05    8.9687E-04    1.0103E-05    2.8535E-05    1.0109E-02    2.4875E-04    1.2934E-03    2.7423E-04    9.2567E-05    8.5170E-05
  3   3101    2.2476E-05    7.3511E-04    8.0029E-06    2.5326E-05    8.6455E-03    2.1046E-04    1.06C3E-03    2.2705E-04    9.9698E-05    8.3989E-05
  4   6801    4.4749E-05    1.4835E-03    1.8638E-05    4.5462E-05    1.8336E-02    4.6989E-04    2.3774E-03    5.1420E-04    6.2007E-05    1.2880E-04
  5   6802    3.3644E-05    1.1531E-03    1.3345E-05    3.3915E-05    1.2344E-02    3.0675E-04    1.6454E-03    3.4339E-04    7.8894E-05    8.6057E-05
TOPCGU
  1   700     3.1275E-05    9.7354E-04    1.1195E-05    3.3021E-05    1.1493E-02    2.9177E-04    1.5293E-03    3.1155E-04    8.9678E-05    7.9576E-05
TOPCGP
  1   700     8.0039E-05    1.0384E-C3    6.0095E-05    8.1608E-05    1.1820E-02    3.4786E-04    1.6084E-03    3.6947E-04    1.3186E-04    1.3025E-04
PCGTOT
  1   700     0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0
  2   800     0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0
  3   3101    0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0
  4   6801    0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0
  5   6802    0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0



GDOBTU
  1   700     0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0           0.0
GDOOOL
  1   700     4.4200E C5    1.0394E 06    1.4156E 06    8.7760E 05    1.5981E 07    3.2220E 05    1.2784E 06    1.6210E 06    2.4549E 06    3.5558E 06
TFDOOL
  1   700     3.9700E 04    8.2290E 05    1.1200E 04    1.9000E 04    1.3202E 07    2.5800E 05    1.0574E 06    3.1810E 05    1.3050E 05    1.1120E 05
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                     91           92           93           94           95           96           97           98           99           100
         CODE        2003         2004         2005         2006         2007         2008         2009         2100         2201         2202
OIRBTU
  1     700     9.4492E-04 0.0          5.8289E-04 1.5400E-03 7.3424E-04 8.0420E-03 0.0          2.4848E-04 3.2729E-03 7.5338E-04
  2     800     0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  3    3101     2.4804E-03 7.4976E-04 5.5682E-04 2.0572E-03 5.6910E-04 8.1654E-03 4.4841E-03 9.3452E-04 3.4156E-03 8.7410E-04
  4    6801     1.6036E-03 1.1141E-03 9.3273E-04 1.9954E-03 4.6605E-04 7.3252E-04 2.6036E-03 1.3166E-03 1.1682E-03 5.2187E-04
  5    6802     2.0218E-03 0.0          8.1535E-04 3.9965E-03 1.1072E-03 1.8533E-02 3.8677E-03 1.6686E-03 5.9481E-04 5.2665E-04
INVBTU
  1     700     1.1245E-02 9.5329E-03 1.1915E-02 1.2472E-02 1.7077E-02 3.2277E-02 1.5535E-02 2.2939E-02 1.6187E-02 1.9204E-02
  2     800     2.9111E-02 2.6212E-02 2.4257E-02 3.1996E-02 2.7840E-02 7.3873E-02 3.4372E-02 2.9428E-02 2.7904E-02 2.9558E-02
  3    3101     1.6950E-02 1.8162E-02 1.3878E-02 1.7183E-02 1.5649E-02 3.0644E-02 1.8786E-02 1.6914E-02 1.6922E-02 1.6137E-02
  4    6801     3.8922E-03 3.4542E-03 3.6842E-03 4.0171E-03 3.5927E-03 6.6798E-03 4.9711E-03 4.1459E-03 3.8879E-03 4.3195E-03
  5    6802     1.2300E-02 9.2985E-03 1.1234E-02 1.4877E-02 1.3268E-02 4.6142E-02 1.6188E-02 1.3817E-02 1.2027E-02 1.4431E-02
TCINBU
  1     700     3.6312E-02 3.2156E-02 3.2345E-02 4.0295E-02 4.1185E-02 9.9211E-02 4.4743E-02 4.8060E-02 4.0052E-02 4.4275E-02
TCINBP
  1     700     4.2680E-02 3.7807E-02 3.8373E-02 4.6867E-02 4.7062E-02 1.1014E-01 5.2875E-02 5.4843E-02 4.6413E-02 5.1342E-02
PCGDOB
  1     700     5.2234E-06 4.5809E-07 1.1070E-05 2.2376E-05 7.2487E-06 7.7552E-06 2.6265E-04 1.3228E-05 1.7327E-03 1.3849E-03
  2     800     4.9325E-06 4.5945E-07 8.2203E-06 2.0938E-05 4.3106E-06 6.4744E-06 2.1197E-04 6.1900E-06 1.0895E-03 7.7752E-04
  3    3101     4.4485E-06 4.9307E-07 7.2843E-06 1.7416E-05 3.7529E-06 4.1598E-06 1.7944E-04 5.5104E-06 1.0234E-03 6.5745E-04
  4    6801     7.2170E-06 6.6256E-07 1.3663E-05 2.8767E-05 6.0874E-06 6.4065E-06 3.3549E-04 9.5429E-06 1.6612E-03 1.2434E-03
  5    6802     5.1695E-06 4.0428E-07 9.4430E-06 2.4148E-05 5.0955E-06 1.0031E-05 2.4763E-04 7.2088E-06 1.1648E-03 9.4159E-04
TCPCGU
  1     700     4.7388E-06 4.3406E-07 8.4061E-06 2.0406E-05 4.9739E-06 6.8672E-06 2.1199E-04 7.8899E-06 1.2122E-03 9.0250E-04
TOPCGP
  1     700     5.3364E-05 4.8588E-05 5.7183E-05 6.9049E-05 5.3447E-05 5.5101E-05 2.6539E-04 5.6307E-05 1.2614E-03 9.5225E-04
PCGTOT
  1     700     0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  2     800     0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  3    3101     0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  4    6801     0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  5    6802     0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0



GODBTU
  1     700     0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
GODDOL
  1     700     4.2910E 05 2.2800E 05 1.2732E 06 1.6042E 06 4.0000E 05 2.5740E 05 9.7640E 05 4.1950E 05 1.9439E 06 1.0503E 06
TFDDOL
  1     700     5.8000E 03 6.0000E 02 1.1600E 04 2.2400E 04 5.3000E 03 3.0000E 03 2.1110E 05 7.2000E 03 1.3365E 06 9.0040E 05
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                      101         102         103         104         105         106         107         108         109         110
       CODE           2203        2204        2301        2302        2303        2304        2305        2306        2307        2401
DIRBTU
  1     700       9.0768E-04  2.1596E-04  7.2564E-03  2.8102E-03  2.6370E-03  6.8290E-04  1.1783E-03  7.5566E-04  2.5801E-03  2.0888E-02
  2     800       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  3    3101       6.0979E-C4  6.2989E-04  5.7084E-04  6.7940E-04  6.6150E-04  7.6749E-04  7.5412E-04  7.1425E-04  5.0688E-04  2.5158E-02
  4    6801       8.6248E-04  4.8550E-04  8.7006E-04  1.0907E-03  1.0283E-03  7.1025E-04  9.9101E-04  1.0390E-03  1.0852E-03  6.5855E-03
  5    6802       1.9970E-03  1.1450E-03  0.0         3.8438E-03  2.0576E-03  1.8473E-03  3.2530E-03  1.7111E-03  1.5857E-03  4.1732E-02
INVBTU
  1     700       4.2395E-C2  2.8534E-02  2.3797E-02  3.8538E-02  3.0568E-02  1.5794E-02  4.2724E-02  3.7672E-02  3.0678E-02  5.5413E-02
  2     800       4.4469E-02  3.2199E-02  2.6208E-02  3.5993E-02  3.5415E-02  2.8131E-02  3.7597E-02  3.9751E-02  3.2492E-02  1.0593E-01
  3    3101       1.8847E-02  1.6343E-02  1.4554E-02  1.5124E-02  1.6744E-02  1.3591E-02  1.5686E-02  1.7988E-02  1.5281E-02  4.4577E-02
  4    6801       7.4826E-03  4.5627E-03  3.9175E-03  4.8735E-03  5.2471E-03  3.8254E-03  4.9734E-03  6.8093E-03  5.2445E-03  1.0535E-02
  5    6802       2.7304E-02  1.7140E-02  1.2468E-02  2.2215E-02  1.9874E-02  1.5452E-02  2.3388E-02  2.3378E-02  1.8431E-02  6.6583E-02
TCINBU
  1     700       7.9091E-02  5.5993E-02  4.5935E-02  6.9468E-02  6.0532E-02  3.9951E-02  7.5154E-02  7.0349E-02  5.7722E-02  1.5040E-01
TCINBP
  1     700       9.1332E-02  6.3457E-02  5.2344E-02  7.7441E-02  6.9116E-02  4.6210E-02  8.3291E-02  8.1489E-02  6.6302E-02  1.6763E-01
PCGOOB
  1     700       1.4400E-03  1.3858E-03  1.9269E-04  1.0905E-03  5.0996E-04  3.4926E-04  1.0532E-03  4.7037E-04  3.3809E-04  8.2858E-04
  2     800       5.5095E-04  5.7042E-04  7.7405E-05  3.7150E-04  2.1551E-04  2.2690E-04  3.3807E-04  1.8104E-04  1.3061E-04  5.7776E-04
  3    3101       3.6108E-04  4.4843E-04  6.6579E-05  2.4178E-04  1.5782E-04  1.6980E-04  2.1847E-04  1.2689E-04  9.5144E-05  3.7658E-04
  4    6801       1.0145E-03  8.8454E-04  1.2662E-04  5.5045E-04  3.4942E-04  3.3766E-04  4.8939E-04  3.3937E-04  2.3070E-04  6.2881E-04
  5    6802       8.3911E-04  7.5317E-04  9.1339E-05  5.6874E-04  2.9999E-04  3.0916E-04  5.2165E-04  2.6410E-04  1.8377E-04  9.0080E-04
TOPCGU
  1     700       7.6078E-04  7.7651E-04  1.0595E-04  5.6528E-04  2.8741E-04  2.5000E-04  5.3411E-04  2.4841E-04  1.8057E-04  6.4677E-04
TOPCGP
  1     700       8.0680E-04  8.0658E-04  1.5260E-04  5.9053E-04  3.3144E-04  2.9817E-04  5.5741E-04  2.9699E-04  2.2746E-04  6.6855E-04
PCGTOT
  1     700       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  2     800       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  3    3101       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  4    6801       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  5    6802       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0



GCOBTU
  1     700       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
GDOOOL
  1     700       5.7830E 05  6.8530E 05  1.1230E 05  4.1050E 05  3.0030E 05  4.2320E 05  4.4350E 05  2.0090E 05  1.5790E 05  1.1571E 06
TFOODL
  1     700       4.2410E 05  6.0640E 05  1.0110E 05  3.5330E 05  2.0830E 05  2.7610E 05  3.0780E 05  1.5590E 05  1.3760E 05  1.8670E 05
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                    111         112         113         114         115         116         117         118         119         120
      CODE          2402        2403        2404        2405        2406        2407        2500        2601        2602        2603
DIRBTU
  1    700      4.8298E-02  6.5473E-02  0.0         7.6306E-04  1,0671E-01  2.3835E-03  8.1799E-04  0.0         1.9395E-04  1.6447E-04
  2    800      0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  3   3101      1.8285E-02  3.2747E-02  4.5450E-04  9.7107E-04  2.3083E-02  3.4843E-03  2.0290E-03  1.8422E-03  7.7682E-04  1.1106E-03
  4   6901      6.8444E-03  4.4C70E-03  8.2304E-04  6.7336E-04  1.2874E-04  1.3073E-03  9.3275E-04  8.4814E-04  2.6084E-04  4.0404E-04
  5   6802      2.4887E-02  3.4229E-02  1.4930E-03  9.2235E-05  1.5258E-01  2.3124E-03  2.2269E-03  8.8317E-04  2.1261E-04  5.3286E-04
INVBTU
  1    700      8.3040E-02  9.2607E-02  3.3218E-02  4.3517E-02  1.2571E-01  4.2039E-02  4.4555E-02  2.1165E-02  1.5337E-02  1.5107E-02
  2    800      8.7888E-02  1.0421E-01  4.4623E-02  5.1133E-02  2.0551E-01  5.9098E-02  6.0456E-02  2.9797E-02  3.0210E-02  2.6698E-02
  3   3101      3.9211E-02  5.1403E-02  1.9964E-02  2.5234E-02  4.0357E-02  2.8129E-02  2.9531E-02  1.4874E-02  1.5386E-02  1.3706E-02
  4   6801      1.1165E-02  8.2427E-03  5.4117E-03  6.4184E-03  3.8810E-03  7.1470E-03  5.5248E-03  3.9764E-03  3.6115E-03  3.2488E-03
  5   6802      5.2613E-02  5.7632E-02  2.4960E-02  2.8070E-02  1.7195E-01  3.1890E-02  3.2322E-02  1.5893E-02  1.5500E-02  1.3318E-02
TGINBU
  1    700      1.5933E-01  1.8825E-01  7.2219E-02  8.7982E-02  3.2719E-01  9.3713E-02  9.9272E-02  4.6831E-02  4.5795E-02  3.8430E-02
TCINBP
  1    700      1.7760E-01  2.0174E-01  8.1073E-02  9.8483E-02  3.3354E-01  1.0541E-01  1.0831E-01  5.3336E-02  5.1704E-02  4.3745E-02
PCGCOB
  1    700      1.3980E-03  8.1363E-04  8.8592E-05  2.6425E-03  8.6587E-05  1.9020E-03  7.0833E-04  1.9826E-03  1.0116E-03  1.6493E-03
  2    800      5.3970E-04  3.3397E-04  4.3411E-05  1.1326E-03  5.1633E-05  9.7530E-04  3.5059E-04  1.0181E-03  5.7649E-04  1.0633E-03
  3   3101      3.7295E-04  2.5516E-04  3.0082E-05  8.6571E-04  1.5705E-05  7.1902E-04  2.6524E-04  7.8720E-04  4.5477E-04  8.4541E-04
  4   6801      7.5026E-04  2.8907E-04  5.7611E-05  1.5558E-03  1.0670E-05  1.2907E-03  3.5060E-04  1.4868E-03  7.5417E-04  1.4158E-03
  5   6802      8.0139E-04  4.5814E-04  6.0231E-05  1.5422E-03  1.0716E-04  1.3054E-03  4.6492E-04  1.3470E-03  7.3368E-04  1.3156E-03
TOPCGU
  1    700      7.7141E-04  4.8347E-04  5.5225E-05  1.5337E-03  6.7164E-05  1.2146E-03  4.5796E-04  1.2499E-03  6.8523E-04  1.1958E-03
TCPCGP
  1    700      7.8807E-04  4.9295E-04  1.0190E-04  1.5256E-03  1.0718E-04  1.2245E-03  4.7799E-04  1.2754E-03  7.1469E-04  1.2215E-03
PCGTOT
  1    700      0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  2    800      0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  3   3101      0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  4   6801      0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  5   6802      0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0



GDOBTU
  1    700      0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
GDODOL
  1    700      5.0544E 06  2.5574E 06  3.6290E 05  1.0018E 06  3.5390E 05  3.6154E 06  4.7483E 06  4.4950E 06  2.3018E 06  2.4678E 06
TFDDOL
  1    700      2.1020E 05  1.0570E 05  3.3300E 04  7.5820E 05  8.6000E 03  5.6490E 05  1.9850E 05  1.1696E 06  6.5320E 05  1.3632E 06
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                   121        122        123        124        125        126        127        128        129        130
      CODE         2604       2605       2606       2607       2608       2701       2702       2703       2704       2801
DIRBTU
  1   700      0.0        3.5446E-04 0.0        0.0        0.0        4.9218E-02 0.0        0.0        8.8722E-03 1.5800E-02
  2   800      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        6.0927E-02 0.0
  3  3101      8.7752E-04 1.6233E-03 9.2271E-04 8.2906E-04 6.0418E-04 3.1126E-02 1.8514E-02 1.6041E-02 3.1598E-02 2.3352E-02
  4  6801      3.7566E-04 9.8594E-04 6.4777E-04 9.0269E-04 9.7892E-04 2.3213E-02 2.7771E-03 6.3327E-04 1.8083E-03 3.0020E-03
  5  6802      4.1825E-04 1.5866E-03 4.0718E-04 1.4882E-03 0.0        7.6123E-02 8.7333E-03 4.6817E-03 7.5208E-02 7.7447E-03
INVBTU
  1   700      1.6406E-02 2.7729E-02 2.4841E-02 1.8057E-02 1.2743E-02 1.1825E-01 5.1096E-02 5.9916E-02 4.6846E-02 7.8720E-02
  2   800      2.5541E-02 4.3417E-02 3.2984E-02 2.9451E-02 1.8725E-02 1.8642E-01 1.1978E-01 1.2951E-01 2.3304E-01 1.2897E-01
  3  3101      1.2499E-02 1.8568E-02 1.6287E-02 1.3390E-02 9.2334E-03 6.0283E-02 5.3911E-02 5.5603E-02 5.9870E-02 5.9284E-02
  4  6801      3.2732E-03 5.5101E-03 4.3565E-03 3.7498E-03 3.2573E-03 3.0403E-02 1.5028E-02 1.5494E-02 9.9017E-03 1.7489E-02
  5  6802      1.3502E-02 2.4292E-02 1.7756E-02 1.6034E-02 9.9870E-03 1.3110E-01 7.0962E-02 7.5076E-02 1.1645E-01 7.4003E-02
TCINBU
  1   700      3.8547E-02 6.5421E-02 5.3300E-02 4.3613E-02 2.8084E-02 2.7309E-01 1.5526E-01 1.7333E-01 2.6960E-01 1.8953E-01
TCINBP
  1   700      4.3902E-02 7.4436E-02 6.0427E-02 4.9747E-02 3.3413E-02 3.2283E-01 1.7985E-01 1.9868E-01 2.8580E-01 2.1814E-01
PCGODB
  1   700      1.0840E-04 8.0014E-04 1.0723E-04 3.8236E-04 5.2457E-05 1.9314E-02 6.4945E-04 6.0175E-04 2.1063E-03 1.8889E-03
  2   800      6.1557E-C5 4.5700E-04 5.1939E-05 2.2749E-04 2.8118E-05 1.1106E-02 5.5531E-04 4.7445E-04 3.8221E-03 1.1289E-03
  3  3101      4.6660E-05 3.0924E-04 3.9722E-05 1.6019E-04 2.1475E-05 5.5627E-03 3.8714E-04 3.1550E-04 1.5209E-03 8.0369E-04
  4  6801      8.6329E-05 6.3468E-04 7.5068E-05 3.1695E-04 5.3524E-05 1.9821E-02 7.6246E-04 6.2116E-04 1.7771E-C3 1.6751E-03
  5  6802      8.0718E-05 6.3423E-04 6.9351E-05 3.0721E-04 3.7198E-05 1.9373E-02 8.1606E-04 6.8221E-04 4.7373E-03 1.6066E-03
TOPCGU
  1   700      7.2570E-C5 5.3814E-04 6.5690E-05 2.6297E-04 3.2298E-05 1.2498E-02 5.5808E-04 4.9461E-04 3.5587E-03 1.2898E-03
TOPCGP
  1   700      1.1978E-04 5.7616E-04 1.1270E-04 3.0709E-04 8.1839E-05 1.2837E-02 6.0670E-04 5.3747E-04 3.2827E-03 1.3293E-03
PCGTOT
  1   700      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2   800      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3  3101      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4  6801      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5  6802      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GDOBTU
  1   700      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GDOOOL
  1   700      4.5630E 05 5.3072E 06 9.2240E 05 3.4600E 05 9.7770E 05 1.2613E 07 1.4246E 06 5.8330E 05 2.7153E 06 3.2390E 06
TFOOOL
  1   700      8.2500E 04 3.6030E 05 5.3900E 04 2.6440E 05 5.1400E 04 2.0393E 06 1.5870E 05 1.2540E 05 5.6140E C5 2.9960E 05
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                       131          132          133          134          135          136          137          138          139          140
       CODE            2802         2803         2804         2901         2902         2903         3000         3101         3102         3103
DIRBTU
  1    700         0.0          8.9094E-02   0.0          3.4037E-03   2.3768E-03   0.0          6.0239E-04   9.1173E-04   0.0          4.9840E-03
  2    800         0.0          0.0          0.0          0.0          0.0          0.0          0.0          9.4928E-01   0.0          0.0
  3   3101         7.5809E-02   1.1572E-02   1.4269E-02   1.9397E-02   1.8103E-02   1.3640E-02   2.3667E-02   6.8090E-02   3.6686E-01   3.3069E-01
  4   6801         3.6337E-03   1.0394E-03   2.0669E-03   1.0219E-03   5.4599E-04   2.4030E-04   3.3308E-04   1.7823E-03   1.6199E-03   1.4037E-03
  5   6802         1.8400E-02   1.0304E-02   1.1435E-02   1.4544E-03   3.8387E-03   2.3770E-04   1.2260E-03   3.4463E-02   1.5571E-02   1.6438E-02
INVBTU
  1    700         6.4401E-02   1.2176E-01   4.0238E-02   1.9858E-02   3.6306E-02   2.3280E-02   4.0677E-02   1.3728E-02   1.6183E-02   4.3523E-02
  2    800         1.9741E-01   7.6026E-02   8.3192E-02   4.9604E-02   8.2715E-02   5.9162E-02   9.4881E-02   1.8003E-01   4.2869E-01   4.0961E-01
  3   3101         1.1526E-01   3.4117E-02   3.4928E-02   3.3628E-02   4.3574E-02   3.5974E-02   3.3673E-02   8.6053E-02   4.1624E-01   3.6887E-01
  4   6801         1.8517E-02   8.1616E-03   1.0991E-02   4.4703E-03   8.1137E-03   3.4301E-03   9.6311E-03   4.8525E-03   5.2336E-03   5.3767E-03
  5   6802         8.9990E-02   4.3451E-02   3.1714E-02   1.8766E-02   4.0876E-02   2.5435E-02   4.4006E-02   6.6697E-02   4.6522E-02   7.3508E-02
TOINBU
  1    700         2.4258E-01   1.8531E-01   1.1201E-01   6.4818E-02   1.1079E-01   7.6801E-02   1.2553E-01   1.8872E-01   4.3944E-01   4.4755E-01
TCIN8P
  1    700         2.7287E-01   2.0266E-01   1.2999E-01   7.2132E-02   1.2407E-01   8.5684E-02   1.4132E-01   1.9666E-01   4.4800E-01   4.5635E-01
PCGDOB
  1    700         8.1082E-04   3.5788E-04   4.3667E-04   4.1684E-03   6.0539E-03   3.0942E-03   3.2253E-04   1.1088E-02   7.5175E-06   3.1023E-05
  2    800         9.0661E-04   9.0618E-05   3.2932E-04   3.7982E-03   5.0035E-03   2.8684E-03   2.7441E-04   5.3042E-02   7.2639E-05   1.0650E-04
  3   3101         8.1988E-04   6.2586E-05   2.1615E-04   3.9881E-03   4.0826E-03   2.7013E-03   2.4044E-04   3.5269E-02   1.0924E-04   1.4855E-04
  4   6801         9.3058E-04   1.0646E-04   4.7612E-04   3.7457E-03   5.3709E-03   2.8810E-03   3.0545E-04   1.5645E-02   9.7043E-06   1.5298E-05
  5   6802         1.0251E-03   1.3438E-04   5.0777E-04   3.5643E-03   6.1332E-03   3.0613E-03   3.1570E-04   4.8742E-02   1.9553E-05   4.7407E-05
TCPCGU
  1    700         8.7491E-04   1.8089E-04   3.4348E-04   3.9158E-03   3.2736E-03   2.9346E-03   2.8304E-04   4.5050E-02   6.0834E-05   9.5066E-05
TOPCGP
  1    700         8.9568E-04   2.1465E-04   3.9279E-04   3.7959E-03   5.1296E-03   2.8647E-03   3.2477E-04   4.0269E-02   1.0166E-04   1.3156E-04
PCGTOT
  1    700         0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  2    800         0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  3   3101         0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  4   6801         0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  5   6802         0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0



GDO8TU
  1    700         0.0          0.0          0.0          0.0          0.0          0.0          0.0          2.2100E 07   0.0          0.0
GDOOOL
  1    700         9.4550E 05   8.1030E 05   1.4953E 06   4.0575E 06   3.3101E 06   2.0569E 06   2.4621E 06   2.0858E 07   4.6300E 05   5.2970E 05
TFDOOL
  1    700         1.5720E 05   4.0800E 04   1.3550E 05   2.6210E 06   2.0706E 06   1.6596E 06   9.9000E 04   1.0085E 07   5.8000E 03   8.9000E 03
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                       141        142        143        144        145        146        147        148        149        150
          CODE         3201       3202       3203       3204       3300       3401       3402       3403       3501       3502
DIR8TU
  1    700        1.0968E-02 5.5649E-04 6.5251E-03 1.1316E-03 8.7779E-03 6.0371E-04 6.0255E-04 0.0        6.5774E-03 1.6701E-03
  2    800        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101        1.8465E-03 4.8661E-03 4.7464E-03 2.6616E-03 8.2075E-03 4.0995E-04 1.5727E-03 4.5165E-04 1.9301E-03 1.3588E-02
  4   6801        2.0199E-03 1.9725E-03 2.3488E-03 2.3393E-03 9.8574E-04 6.8753E-04 5.4335E-04 4.8416E-04 3.2775E-03 4.9544E-03
  5   6802        3.7075E-03 6.6773E-04 3.2104E-03 2.3555E-03 5.0366E-03 7.6758E-04 2.6953E-04 5.0344E-05 4.4142E-02 7.2086E-02
INV8TU
  1    700        3.7270E-02 1.9108E-02 3.4649E-02 3.7960E-02 2.0161E-02 2.1237E-02 1.4030E-02 1.5876E-02 2.3219E-02 3.0343E-02
  2    800        5.7381E-02 3.5149E-02 5.8524E-02 6.2035E-02 3.6317E-02 3.0829E-02 2.4414E-02 2.7432E-02 7.3853E-02 1.2688E-01
  3   3101        2.7854E-02 2.0127E-02 2.9826E-02 2.8853E-02 1.9528E-02 1.6290E-02 1.3869E-02 1.5081E-02 1.2251E-02 3.0120E-02
  4   6801        7.3893E-03 5.7758E-03 8.1759E-03 9.7062E-03 2.9830E-03 3.9053E-03 3.0949E-03 3.8666E-03 6.1374E-03 9.7667E-03
  5   6802        3.0255E-02 1.6454E-02 3.0366E-02 3.5274E-02 1.6899E-02 1.5367E-02 1.1269E-02 1.3268E-02 6.3712E-02 1.0097E-01
TCIN8U
  1    700        8.6975E-02 4.8257E-02 8.4680E-02 8.9912E-02 5.3379E-02 4.8009E-02 3.5228E-02 3.9290E-02 9.0657E-02 1.4708E-01
TCINBP
  1    700        9.9064E-02 5.7706E-02 9.8056E-02 1.0579E-01 5.8259E-02 5.4398E-02 4.0291E-02 4.5616E-02 1.0074E-01 1.6306E-01
PCGD08
  1    700        4.0509E-03 5.2567E-04 1.2785E-03 1.1322E-03 5.5221E-05 1.1736E-05 2.6129E-03 8.5773E-04 7.4086E-04 1.2102E-04
  2    800        2.2750E-03 3.5272E-04 7.8768E-04 6.7490E-04 3.6285E-05 6.2143E-06 1.6585E-03 5.4062E-04 8.5957E-04 1.8460E-04
  3   3101        1.7104E-03 3.1284E-04 6.2175E-04 4.8619E-04 3.0220E-05 5.0860E-06 1.4593E-03 4.6035E-04 2.2085E-04 6.7872E-05
  4   6801        3.2059E-03 6.3427E-04 1.2042E-03 1.1556E-03 3.2614E-05 8.6147E-06 2.3008E-03 8.3390E-04 7.8169E-04 1.5549E-04
  5   6802        2.9753E-03 4.0955E-04 1.0138E-03 9.5190E-04 4.1880E-05 7.6836E-06 1.8990E-03 6.4860E-04 1.8393E-03 3.6437E-04
TOPCGU
  1    700        2.6935E-03 3.7000E-04 8.8375E-04 7.5302E-04 4.2420E-05 7.5765E-06 1.8660E-03 5.9972E-04 8.3352E-04 1.6909E-04
TOPCGP
  1    700        2.6924E-03 4.3215E-04 9.3207E-04 8.1501E-04 8.8303E-05 5.5941E-05 1.8886E-03 6.4988E-04 8.4456E-04 2.0971E-04
PCGTOT
  1    700        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2    800        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4   6801        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5   6802        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GC08TU
  1    700        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GODDDL
  1    700        3.1553E 06 3.7040E 05 2.8564E 06 3.8146E 06 9.6700E 05 2.4230E 05 2.3688E 06 8.1990E 05 1.9210E 06 1.0192E 06
TFDDOL
  1    700        1.3571E 06 3.4350E 05 4.6070E 05 3.7240E 05 3.4200E 04 6.9000E 03 2.3254E 06 6.7460E 05 3.9840E 05 4.9800E 04
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                    151         152         153         154         155         156         157         158         159         160
     CODE           3601        3602        3603        3604        3605        3606        3607        3608        3609        3610
DIRBTU
  1   700       1.6376E-01  0.0         0.0         0.0         5.0846E-02  7.3413E-03  0.0         7.9411E-03  0.0         0.0
  2   800       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  3  3101       2.1632E-02  1.5316E-02  4.1896E-03  4.9872E-03  4.5887E-03  2.9107E-03  1.9101E-03  6.6943E-03  1.9663E-03  8.4031E-03
  4  6801       1.6068E-02  5.3571E-03  2.0889E-03  3.2776E-03  3.1227E-03  2.0866E-03  1.7748E-03  2.3535E-03  1.9117E-03  1.2569E-03
  5  6802       1.5029E-01  1.8363E-01  3.6655E-02  9.8653E-02  1.4315E-01  2.6524E-02  3.1404E-02  1.7241E-02  2.4515E-02  8.3414E-03
INVBTU
  1   700       2.0322E-01  1.7716E-02  2.0381E-02  1.9647E-02  6.5803E-02  2.8734E-02  1.8659E-02  2.3753E-02  2.0266E-02  4.1102E-02
  2   800       2.0752E-01  2.2620E-01  7.3344E-02  1.3650E-01  1.7729E-01  6.3078E-02  6.6476E-02  5.0132E-02  6.3726E-02  7.4009E-02
  3  3101       3.8789E-02  2.7520E-02  1.7985E-02  1.9176E-02  1.4661E-02  1.6192E-02  1.4518E-02  1.6500E-02  1.5311E-02  3.0803E-02
  4  6801       1.9128E-02  7.5294E-03  6.0971E-03  6.4817E-03  5.3927E-03  6.4527E-03  5.6433E-03  5.5597E-03  6.2530E-03  6.3670E-03
  5  6802       1.7609E-01  2.0517E-01  5.7633E-02  1.2099E-01  1.6703E-01  4.8595E-02  5.3734E-02  3.5451E-02  5.0081E-02  4.6522E-02
TCINBU
  1   700       3.9088E-01  2.3609E-01  8.7391E-02  1.4942E-01  2.3749E-01  8.5110E-02  7.9273E-02  6.8110E-02  7.7496E-02  1.0850E-01
TOINBP
  1   700       4.2217E-01  2.4841E-01  9.7366E-02  1.6002E-01  2.4631E-01  9.5666E-02  8.8505E-02  7.7205E-02  8.7726E-02  1.1891E-01
PCG008
  1   700       2.2787E-05  3.4053E-06  1.0610E-05  3.1628E-05  1.9500E-05  1.5649E-05  1.2971E-04  1.5594E-05  7.1740E-05  1.9422E-05
  2   800       8.4876E-06  1.5860E-05  1.3927E-05  8.0155E-05  1.9163E-05  1.2531E-05  1.6857E-04  1.5085E-05  8.2287E-05  1.2757E-05
  3  3101       2.4572E-06  2.9885E-06  5.2897E-06  1.7440E-05  2.4545E-06  4.9822E-06  5.7022E-05  7.6901E-06  3.0623E-05  8.2234E-06
  4  6801       8.5611E-06  5.7770E-06  1.2670E-05  4.1650E-05  6.3788E-06  1.4028E-05  1.5660E-04  1.8307E-05  8.8358E-05  1.2009E-05
  5  6802       1.7864E-05  3.5683E-05  2.7146E-05  1.7622E-04  4.4782E-05  2.3945E-05  3.3798E-04  2.6460E-05  1.6041E-04  1.9890E-05
TCPCGU
  1   700       1.2770E-05  1.3362E-05  1.3086E-05  7.0326E-05  2.0837E-05  1.3283E-05  1.5838E-04  1.6042E-05  7.8374E-05  1.4849E-05
TCPCGP
  1   700       6.0383E-05  6.0596E-05  6.1086E-05  1.1315E-04  6.7060E-05  6.1397E-05  2.0065E-04  6.4211E-05  1.2496E-04  6.2526E-05
PCGTOT
  1   700       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  2   800       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  3  3101       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  4  6801       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  5  6802       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0



G008TU
  1   700       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
GCODOL
  1   700       1.1968E 06  3.1920E 05  1.9030E 05  2.0440E 05  1.6410E 05  1.5350E 05  1.1570E 05  1.3660E 05  9.9200E 04  5.3350E 05
TFODOL
  1   700       1.4000E 03  2.4000E 03  6.5000E 03  2.0100E 04  3.7000E 03  6.8000E 03  8.6800E 04  1.0300E 04  4.4200E 04  5.9000E 03
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                  161        162        163        164        165        166        167        168        169        170
      CODE        3611       3612       3613       3614       3615       3616       3617       3618       3619       3620
OIRBTU
  1    700    1.4605E-03 0.0        0.0        6.9822E-03 2.0035E-03 3.9750E-03 0.0        2.9636E-03 0.0        0.0
  2    800    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101    4.5385E-03 6.9734E-03 2.2605E-02 1.8025E-02 8.0529E-03 4.0861E-03 6.0034E-03 7.7748E-03 1.2830E-02 4.7621E-03
  4   6801    8.4745E-04 6.5C07E-04 7.2816E-03 4.1908E-03 3.0734E-03 2.5625E-03 2.4797E-03 1.3599E-03 4.3440E-03 4.4518E-03
  5   6802    5.0545E-03 2.2456E-03 1.0455E-01 4.0721E-02 5.5736E-04 6.2506E-03 5.2339E-03 2.2911E-03 2.8272E-02 4.3791E-02
INVBTU
  1    700    3.8599E-02 5.6221E-02 2.8803E-02 3.6480E-02 1.8827E-02 2.0633E-02 3.2024E-02 2.4479E-02 2.8831E-02 2.6688E-02
  2    800    5.2740E-02 8.2673E-02 1.6513E-01 9.9430E-02 4.0854E-02 3.4325E-02 7.9558E-02 5.1630E-02 9.9087E-02 9.0545E-02
  3   3101    2.2697E-02 3.2998E-02 4.2304E-02 3.7836E-02 2.3676E-02 1.4664E-02 4.4716E-02 2.8316E-02 3.7410E-02 2.0437E-02
  4   6801    4.9636E-03 7.0397E-03 1.1249E-02 7.8714E-03 5.7355E-03 6.5464E-03 8.5619E-03 5.3453E-03 9.9690E-03 8.4081E-03
  5   6802    3.2366E-02 5.3070E-02 1.2911E-01 6.5899E-02 1.6451E-02 2.0684E-02 3.7621E-02 2.3591E-02 6.5508E-02 6.9197E-02
TCINBU
  1    700    8.6182E-02 1.3158E-01 1.8225E-01 1.2773E-01 5.3723E-02 4.8157E-02 1.0269E-01 7.0556E-02 1.1756E-01 1.0850E-01
TCINBP
  1    700    9.4303E-02 1.4310E-01 2.0065E-01 1.4061E-01 6.3106E-02 5.8867E-02 1.1670E-01 7.9301E-02 1.3387E-01 1.2225E-01
PCGOOB
  1    700    2.0403E-G5-1.1257E-05 2.5375E-06 1.2855E-05 9.4543E-05 1.5946E-04 8.7202E-05 9.0183E-06 2.3051E-06 4.1252E-05
  2    800    1.0169E-05-6.0381E-06 5.3067E-06 1.2781E-05 7.4833E-05 9.6768E-05 7.9024E-05 6.9383E-06 2.8947E-06 5.1052E-05
  3   3101    6.7783E-06-3.7328E-06 2.1056E-06 7.5330E-06 6.7171E-05 6.4032E-05 6.8794E-05 5.8938E-06 1.6927E-06 1.7848E-05
  4   6801    1.0473E-05-5.6264E-06 3.9558E-06 1.1072E-05 1.1497E-04 2.0196E-04 9.3064E-05 7.8608E-06 3.1870E-06 5.1878E-05
  5   6802    1.5479E-05-9.6141E-06 1.0291E-05 2.1011E-05 7.4745E-05 1.4464E-04 9.2689E-05 7.8C38E-06 4.7469E-06 9.6775E-05
TOPCGU
  1    700    1.3203E-05-7.6551E-06 4.6417E-06 1.3014E-05 7.5812E-05 1.0265E-04 7.9751E-05 7.4492E-06 2.6830E-06 4.8009E-05
TOPCGP
  1    700    6.0955E-05 4.1400E-05 5.2938E-05 6.C855E-05 1.2557E-04 1.5771E-04 1.2663E-04 5.5753E-05 5.1180E-C5 9.5117E-05
PCGTOT
  1    700    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2    800    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4   6801    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5   6802    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GOOBTU
  1    700    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GCOOOL
  1    700    9.5890E 05 2.2386E 06 1.6930E 05 4.2310E 05 2.3400E 05 7.4480E 05 5.5040E 05 3.2340E 05 2.7130E 05 3.9570E 05
TFOOOL
  1    700    6.6000E 03-2.5000E 03 1.1000E 03 4.4000E 03 6.2700E 04 9.6500E 04 3.4000E 04 4.6000E 03 1.0000E 03 1.9300E 04
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                171        172        173        174        175        176        177        178        179        180
      CODE      3621       3622       3701       3702       3703       3704       3801       3802       3803       3804
OIRBTU
  1    700   0.0        0.0        1.1397E-01 1.7690E-02 1.2240E-02 0.0        4.2026E-03 0.0        4.6894E-02 0.0
  2    800   0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101   6.4464E-03 4.0513E-03 1.7155E-02 3.3367E-03 1.1161E-02 4.8916E-03 1.1656E-02 4.8629E-03 5.7096E-03 6.4312E-03
  4   6801   3.3775E-03 1.6116E-03 4.7352E-03 3.7107E-03 1.9695E-03 4.8197E-03 1.6608E-03 1.1008E-03 1.4223E-02 5.8931E-02
  5   6802   2.6490E-02 3.9549E-03 2.8037E-02 1.1163E-02 1.6989E-02 3.9310E-02 1.8402E-02 1.7366E-02 8.8597E-02 7.4454E-02
INVBTU
  1    703   2.1148E-02 1.6092E-02 1.6940E-01 5.6093E-02 9.2915E-02 3.3397E-02 3.2926E-02 2.6433E-02 8.7839E-02 1.4111E-01
  2    800   9.1177E-02 4.6021E-02 8.7342E-02 4.3059E-02 7.8700E-02 8.3037E-02 8.1163E-02 7.5130E-02 1.3629E-01 1.9081E-01
  3   3101   2.7603E-02 2.1375E-02 3.7373E-02 1.5976E-02 3.3390E-02 1.8004E-02 3.1649E-02 2.4919E-02 2.2780E-02 3.5437E-02
  4   6801   8.2636E-03 4.8534E-03 9.6192E-03 6.9697E-03 7.7864E-03 1.1544E-02 1.0913E-02 8.4549E-03 1.9529E-02 7.7441E-02
  5   6802   6.6919E-02 2.6467E-02 5.4114E-02 2.8626E-02 4.8701E-02 6.7624E-02 5.2910E-02 5.3478E-02 1.1832E-01 1.6177E-01
TCINBU
  1    700   1.0374E-01 5.7071E-02 2.4675E-01 9.1912E-02 1.6353E-01 1.0444E-01 1.0317E-01 9.2779E-02 2.0384E-01 2.5148E-01
TCINBP
  1    700   1.1726E-01 6.5012E-02 2.6248E-01 1.0331E-01 1.7627E-01 1.2333E-01 1.2037E-01 1.0661E-01 2.3579E-01 3.7817E-01
PCGDCB
  1    700   3.9464E-05 1.4564E-05 8.0832E-03 1.9767E-04 4.6137E-05 1.8189E-05 5.5167E-04-3.8741E-05-6.0501E-05 8.4311E-04
  2    800   6.2063E-05 1.5192E-05 1.5202E-03 5.5349E-05 1.4255E-05 1.6496E-05 4.9604E-04-4.0166E-05-3.4241E-05 4.1584E-04
  3   3101   2.9102E-05 1.0929E-05 1.0075E-03 3.1808E-05 9.3675E-06 5.5398E-06 2.9959E-04-2.0634E-05-8.8646E-06 1.1962E-04
  4   6801   6.1554E-05 1.7533E-05 1.8322E-03 9.8039E-05 1.5433E-05 2.5096E-05 7.0310E-04-4.9465E-05-5.3691E-05 1.8469E-03
  5   6802   1.1299E-04 2.1672E-05 2.3363E-03 9.1272E-05 2.1880E-05 3.3322E-05 8.0208E-04-7.0917E-05-7.3734E-05 8.7449E-04
TCPCGU
  1    700   5.5343E-05 1.4716E-05 3.4518E-03 9.2816E-05 2.3679E-05 1.5946E-05 4.8726E-04-3.8594E-05-3.9730E-05 3.6804E-04
TOPCGP
  1    700   1.0242E-04 6.2993E-05 3.1970E-03 1.3834E-04 7.0447E-05 6.4843E-05 5.3981E-04 1.0292E-05 8.8734E-06 5.5821E-04
PCGTOT
  1    700   0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2    800   0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101   0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4   6801   0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5   6802   0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GOOBTU
  1    700   0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GDOODL
  1    700   3.1160E 05 1.0720E 05 1.9989E 07 3.4210E 06 1.1820E 06 3.2290E 05 2.1631E 06 5.1390E 05 3.6440E 05 1.9698E 06
TFOODL
  1    700   2.3300E 04 1.1300E 04 5.9580E 05 4.4000E 04 6.2000E 03 6.8000E 03 2.0920E 05-1.8300E 04-8.6000E 03 7.4600E 04
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                   181        182        183        184        185        186        187        188        189        190
      CODE        3805       3806       3807       3808       3809       3810       3811       3812       3813       3814
DIRBTU
  1    700    0.0        1.7640E-03 3.8102E-03 2.8803E-03 1.5548E-03 1.3395E-03 1.1508E-03 0.0        1.3972E-03 0.0
  2    800    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101    5.8000E-03 8.6909E-03 5.8611E-03 2.2074E-03 1.4337E-03 3.5816E-03 2.3320E-03 2.6938E-03 1.4507E-03 2.9621E-03
  4   6801    2.2044E-02 9.9409E-04 2.3060E-03 3.7378E-03 2.8912E-03 1.8270E-03 2.9657E-03 1.6333E-03 2.1266E-03 3.8125E-03
  5   6802    2.9651E-02 8.8721E-03 4.9417E-03 1.2892E-02 9.1794E-03 1.5165E-03 1.4925E-02 9.5560E-03 9.5871E-03 1.0447E-02
INVBTU
  1    700    5.0539E-C2 1.6195E-C2 3.1024E-C2 8.3501E-02 3.3847E-02 3.2442E-02 5.4414E-02 2.6247E-02 4.0006E-02 5.7195E-02
  2    800    7.9163E-02 4.4825E-02 6.2440E-02 1.2216E-01 5.6425E-02 5.7441E-02 8.8917E-02 5.4697E-02 6.6993E-02 7.8101E-02
  3   3101    2.0470E-C2 2.0753E-02 2.6366E-02 2.4771E-02 1.6119E-02 2.5471E-02 1.9976E-02 1.9078E-02 1.6149E-02 2.43C9E-02
  4   6801    2.5896E-02 6.3711E-03 1.0279E-02 4.3603E-02 1.2343E-02 1.0810E-02 2.5284E-02 8.3793E-03 1.3834E-02 1.8132E-02
  5   6802    6.2136E-02 2.6306E-02 3.8928E-02 1.0155E-01 4.2369E-02 3.4463E-02 7.1475E-02 3.6990E-02 5.2574E-02 5.6765E-02
TCINBU
  1    700    1.0280E-01 5.4402E-02 8.2786E-02 1.6037E-01 7.7450E-02 7.8654E-02 1.17C7E-01 7.2239E-02 9.2628E-02 1.1646E-01
TCINBP
  1    700    1.4517E-01 6.4825E-02 9.9603E-02 2.3170E-01 9.7643E-02 9.6340E-02 1.5843E-01 8.5948E-02 1.1526E-01 1.4612E-01
PCGDCB
  1    700    3.6267E-04 9.4687E-06 6.9324E-05 8.7874E-04-1.5479E-04 3.7701E-04 8.1930E-05 2.5225E-05 3.8448E-06 1.42C0E-05
  2    800    2.0722E-04 9.5595E-06 5.0893E-05 4.6895E-04-9.4124E-05 2.4349E-04 4.8839E-05 1.9175E-05 2.3486E-06 7.0731E-06
  3   3101    8.2992E-05 6.8551E-06 3.3286E-05 1.4728E-04-4.1647E-05 1.6723E-04 1.6993E-05 1.0359E-05 8.7689E-07 3.4098E-06
  4   6801    7.4178E-04 1.4869E-05 9.1687E-05 1.8316E-03-2.2531E-04 5.8146E-04 1.5196E-04 3.2146E-05 5.3071E-06 1.7970E-05
  5   6802    4.0343E-04 1.3915E-05 7.8703E-05 9.6692E-04-1.7531E-04 3.6236E-04 9.7372E-05 3.2165E-05 4.5716E-06 1.2752E-05
TCPCGU
  1    700    1.8811E-04 8.8792E-06 5.1407E-05 4.2432E-04-9.6194E-05 2.5183E-04 4.6082E-05 1.9395E-05 2.4337E-06 7.8719E-06
TCPCGP
  1    700    2.8775E-C4 5.7715E-05 1.0222E-04 6.0478E-04-5.7548E-05 3.1699E-04 1.0401E-04 6.8539E-05 5.1190E-05 5.7180E-05
PCGTOT
  1    700    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2    803    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4   6801    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5   6802    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



CODBTU
  1    700    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GDODCL
  1    700    1.0025E 06 9.2830E 05 1.8415E 06 2.3101E 06 7.4290E 05 2.3757E 06 7.4210E 05 3.5110E 05 3.7710E 05 2.5490E 05
TFDDCL
  1    700    8.9600E 04 7.3000E 03 2.7900E 04 1.3140E 05-5.7100E 04 1.4510E 05 1.8800E 04 1.2000E 04 1.2000E 03 3.1000E 03
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                    191          192          193          194          195          196          157          198          199          200
         COOE       3901         3502         4001         4002         4003         4004         4005         4006         4007         4008
OIR8TU
  1    700      8.6747E-05   0.0          5.9714E-03   0.0          1.4658E-03   4.4931E-04   4.4496E-04   1.4262E-03   2.9377E-04   0.0
  2    800      0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  3   3101      2.0847E-03   3.4621E-03   5.1928E-03   2.6025E-03   2.2642E-03   1.7380E-03   1.3655E-03   2.9014E-03   1.4028E-03   2.0107E-03
  4   6801      9.4704E-04   1.1563E-03   1.9799E-03   1.2012E-03   7.6114E-04   1.0077E-03   9.1561E-04   1.2592E-03   7.0407E-04   1.6694E-02
  5   6802      4.4152E-04   4.5659E-03   1.3344E-02   3.0558E-03   2.3426E-03   1.8211E-03   1.9496E-03   3.8311E-03   2.5435E-03   1.8064E-03
INV8TU
  1    700      7.9224E-02   7.1821E-02   3.9276E-02   2.8479E-02   3.5072E-02   7.1742E-02   4.4574E-02   6.2621E-02   5.8782E-02   7.2994E-02
  2    800      5.3663E-02   5.7092E-02   6.0628E-02   4.5658E-02   3.5493E-02   4.7942E-02   5.6584E-02   4.9088E-02   5.0877E-02   5.5175E-02
  3   3101      2.5115E-02   2.6338E-02   2.1823E-02   1.9503E-02   1.6601E-02   2.1875E-02   1.7244E-02   2.1880E-02   2.0073E-02   2.0716E-02
  4   6801      6.8524E-03   6.7251E-03   5.7230E-03   6.9132E-03   4.9228E-03   6.2064E-03   1.4656E-02   6.5489E-03   8.8542E-03   2.2875E-02
  5   6802      3.0852E-02   3.3191E-02   3.6914E-02   2.7507E-02   2.0258E-02   2.8257E-02   4.1339E-02   2.9357E-02   3.2695E-02   3.6754E-02
TCIN8U
  1    700      1.2577E-C1   1.2193E-C1   9.3959E-02   6.6956E-02   6.5452E-02   1.1324E-01   8.5933E-02   1.0491E-01   1.0046E-01   1.0441E-01
TCIN8P
  1    700      1.3698E-01   1.3293E-01   1.0332E-01   7.8266E-02   7.3506E-02   1.2339E-01   1.0991E-01   1.1562E-01   1.1455E-01   1.4183E-01
PCG008
  1    700      2.7791E-04   1.3520E-04   2.4221E-05   2.6914E-05   3.1404E-04   4.9988E-04   1.4994E-05   3.2098E-03   5.2398E-04   6.6060E-05
  2    800      6.8666E-05   4.0363E-05   1.3638E-05   1.5740E-05   1.1593E-04   1.2185E-04   6.9428E-06   9.1780E-04   1.6543E-04   1.8214E-05
  3   3101      4.9775E-C5   2.8841E-05   7.6037E-06   1.0413E-05   8.3980E-05   8.6113E-05   3.2772E-06   6.3362E-04   1.0109E-04   1.0592E-05
  4   6801      9.5951E-05   5.2029E-05   1.4088E-05   2.6079E-05   1.7595E-04   1.7262E-04   1.9679E-05   1.3399E-03   3.1505E-04   8.2636E-05
  5   6302      9.7922E-05   5.8205E-05   2.0597E-05   2.3520E-05   1.6412E-04   1.7814E-04   1.2581E-05   1.3615E-03   2.6369E-04   3.0095E-05
TOPCGU
  1    700      1.2811E-04   6.8595E-05   1.6759E-05   1.7822E-05   1.6801E-04   2.2907E-04   7.7925E-06   1.5538E-03   2.5464E-04   2.4651E-05
TOPCGP
  1    700      1.6835E-04   1.1276E-04   6.4380E-05   6.6553E-05   2.1093E-04   2.6287E-04   5.7292E-05   1.5201E-03   2.9976E-04   7.8357E-05
PCGTOT
  1    700      0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  2    800      0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  3   3101      0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  4   6801      0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  5   6802      0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0



GCO8TU
  1    700      0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
G0000L
  1    700      2.1097E 06   3.5370E 05   2.4360E 05   3.8260E 05   1.1531E 06   1.9545E 06   1.2737E 06   1.8391E 06   1.5187E 06   3.4700E 05
TFDDOL
  1    700      4.3800E 04   2.4200E 04   7.7000E 03   1.1800E 04   1.1180E 05   8.7000E 04   4.2000E 03   6.4000E 05   1.1130E 05   1.1300E 04
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                    201         202         203         204         205         206         207         208         209         210
         CODE       4009        4101        4102        4201        4202        4203        4204        4205        4206        4207
DIR8TU
  1     700     5.5624E-05  9.2569E-04  1.1269E-03  0.0         1.6884E-03  2.7746E-03  1.1499E-03  4.0191E-04  0.0         0.0
  2     800     0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  3    3101     1.3116E-03  3.0659E-03  2.8507E-03  3.9386E-03  4.6476E-03  3.3402E-03  6.8057E-03  2.2345E-03  1.3693E-03  9.7657E-04
  4    6801     9.1617E-04  1.2845E-03  1.3239E-03  1.1789E-03  1.2443E-03  1.3545E-03  3.1097E-03  9.7453E-04  6.3550E-04  1.2282E-03
  5    6802     1.8432E-04  2.7171E-03  3.0664E-03  4.8962E-04  3.8681E-03  2.5424E-03  1.2971E-02  2.6934E-03  1.7168E-03  1.6625E-02
INV8TU
  1     700     7.6564E-02  4.5679E-02  5.3094E-02  1.9797E-02  2.9014E-02  3.5516E-02  2.4088E-02  8.4207E-02  4.0289E-02  7.8058E-02
  2     800     5.2273E-02  3.8334E-02  4.7796E-02  2.7800E-02  3.2708E-02  3.7332E-02  6.0962E-02  5.6256E-02  3.7955E-02  6.7114E-02
  3    3101     2.2908E-02  1.7526E-02  2.0582E-02  1.5925E-02  1.5779E-02  1.6217E-02  2.2068E-02  2.4849E-02  1.6747E-02  2.2749E-02
  4    6801     8.1144E-03  5.2739E-03  7.3211E-03  4.0758E-03  4.2936E-03  5.6300E-03  8.1852E-03  7.0176E-03  5.3243E-03  6.7319E-03
  5    6802     3.1648E-02  2.2384E-02  2.8854E-02  1.3039E-02  1.8253E-02  2.2456E-02  3.8422E-02  3.3987E-02  2.2679E-02  4.6980E-02
TCINBU
  1     700     1.2041E-01  7.8535E-02  9.3285E-02  4.3363E-02  5.7261E-02  6.7000E-02  7.6548E-02  1.3317E-01  7.2713E-02  1.3818E-01
TLINBP
  1     700     1.3368E-01  8.7163E-02  1.0526E-01  5.0031E-02  6.4286E-02  7.6211E-02  8.9939E-02  1.4465E-01  8.1424E-02  1.4919E-01
PCGOO8
  1     700     2.2075E-04  2.5853E-04  1.3743E-03  4.2333E-04  5.6606E-04  4.6848E-04  2.1221E-06  4.0599E-04  1.9522E-04  1.9380E-05
  2     800     5.4976E-05  9.1384E-05  4.5129E-04  2.1685E-04  2.3277E-04  1.7963E-04  1.9590E-06  9.8937E-05  6.7084E-05  6.0781E-06
  3    3101     3.7317E-05  6.4713E-05  3.0100E-04  1.9240E-04  1.7392E-04  1.2086E-04  1.0984E-06  6.7687E-05  4.5846E-05  3.1910E-06
  4    6801     9.3388E-05  1.3758E-04  7.5645E-04  3.4790E-04  3.3437E-04  2.9644E-04  2.8784E-06  1.3506E-04  1.0298E-04  6.6717E-06
  5    6802     8.2561E-05  1.3236E-04  6.7578E-04  2.5227E-04  3.2220E-04  2.6800E-04  3.0626E-06  1.4826E-04  9.9428E-05  1.0554E-05
TOPCGU
  1     700     1.0001E-04  1.4788E-04  6.9081E-04  2.6270E-04  3.2031E-04  2.5196E-04  1.8949E-06  1.8666E-04  1.0113E-04  9.9577E-06
TOPCGP
  1     700     1.4401E-04  1.8565E-04  7.1971E-04  3.1012E-04  3.5802E-04  2.9550E-04  5.0472E-05  2.2259E-04  1.4558E-04  5.7810E-05
PCGTOT
  1     700     0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  2     800     0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  3    3101     0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  4    6801     0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  5    6802     0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0



GCO8TU
  1     700     0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
GDDDOL
  1     700     8.9370E 05  1.9656E 06  3.0017E 06  3.2310E 05  7.7040E 05  1.8982E 06  8.3550E 05  1.5685E 06  8.0300E 04  2.2640E 05
TFDDCL
  1     700     3.6000E 04  8.1600E 04  3.2320E 05  2.6700E 05  2.4360E 05  1.6470E 05  1.1000E 03  6.0200E 04  6.0500E 04  3.1000E 03
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                   211        212        213        214        215        216        217        218        219        220
      CODE         4208       4209       4210       4211       4301       4302       4400       4501       4502       4503
OIRBTU
  1    700    1.8490E-03 0.0        0.0        4.1232E-04 9.4521E-03 2.9072E-03 4.7503E-03 3.5388E-03 2.7325E-03 0.0
  2    800    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101    2.6331E-03 1.1357E-03 5.4668E-04 6.8825E-04 1.5628E-02 2.9601E-03 1.6525E-03 1.6636E-03 1.3722E-03 1.3065E-03
  4   6801    1.1587E-03 1.9880E-03 1.2738E-03 1.2012E-03 1.4418E-03 1.0511E-03 7.5662E-04 1.3096E-03 1.0354E-03 1.4897E-03
  5   6802    3.4937E-03 4.2587E-03 0.0        1.6582E-03 1.3811E-03 1.7186E-03 3.7035E-03 1.7029E-03 2.7552E-03 6.6796E-03
INVBTU
  1    700    3.2261E-02 3.3432E-02 5.3620E-02 4.6822E-02 3.7413E-02 2.6660E-02 3.8715E-02 3.7154E-02 3.1517E-02 3.2966E-02
  2    800    3.8217E-02 5.9C59E-02 7.8205E-02 4.1256E-02 4.3799E-02 3.0650E-02 3.5725E-02 3.2947E-02 3.0419E-02 3.5843E-02
  3   3101    1.6693E-02 2.0622E-02 2.1482E-02 1.7273E-02 2.8979E-02 1.4623E-02 1.6031E-02 1.5371E-02 1.3445E-02 1.3779E-02
  4   6801    5.4656E-03 1.4258E-02 2.4183E-02 6.5560E-03 5.0587E-03 5.0274E-03 4.4717E-03 5.0023E-03 4.3461E-03 4.9057E-03
  5   6802    2.2684E-02 4.0298E-02 5.9251E-02 2.5193E-02 1.7236E-02 1.7202E-02 2.1016E-02 1.8851E-02 1.7978E-02 2.3279E-02
TCINBU
  1    700    6.4800E-02 7.7679E-02 1.0670E-01 8.1268E-02 7.5956E-02 5.2087E-02 6.9756E-02 6.4905E-02 5.7422E-02 6.3714E-02
TCINBP
  1    700    7.3742E-02 1.0101E-01 1.4627E-01 9.1993E-02 8.4232E-02 6.0312E-02 7.7111E-02 7.3089E-02 6.4532E-02 7.1739E-02
PCGOOB
  1    700    8.1440E-04 1.0710E-06 1.9926E-04 2.2350E-04 1.3544E-03 1.2166E-03 7.0377E-03 6.6375E-03 5.2175E-04 1.1865E-03
  2    800    3.5192E-04 6.9014E-07 1.0601E-04 7.1834E-05 5.7835E-04 5.1020E-04 2.3689E-03 2.1470E-03 1.8369E-04 4.7058E-04
  3   3101    2.3809E-04 3.7325E-07 4.5101E-05 4.6583E-05 5.9269E-04 3.7703E-04 1.6464E-03 1.5514E-03 1.2575E-04 2.8019E-04
  4   6801    5.5075E-04 1.8233E-06 3.5872E-04 1.2492E-04 7.3099E-04 9.1580E-04 3.2447E-03 3.5672E-03 2.8719E-04 7.0480E-04
  5   6802    5.1812E-04 1.1681E-06 1.9922E-04 1.0881E-04 5.6455E-04 7.1025E-04 3.4565E-03 3.0471E-03 2.6928E-04 7.5807E-04
TCPCGU
  1    700    4.6627E-04 6.6506E-07 1.0291E-04 1.1083E-04 7.9249E-04 6.7234E-04 3.6625E-03 3.3202E-03 2.7243E-04 6.5667E-04
TOPCGP
  1    700    5.0579E-04 4.9308E-05 1.7445E-04 1.5660E-04 8.0409E-04 7.2068E-04 3.5262E-03 3.2671E-03 3.1205E-04 6.8503E-04
PCGTOT
  1    700    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2    800    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4   6801    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5   6802    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GOOBTU
  1    700    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GCODOL
  1    700    2.1162E 06 5.0900E 04 3.6410E 05 8.4010E 05 7.3370E 05 1.6738E 06 3.0798E 06 2.9604E 06 4.5720E 05 6.8870E 05
TFODOL
  1    700    3.1520E 05 4.0000E 02 4.6400E 04 5.9600E 04 4.5200E 05 5.6980E 05 2.2697E 06 2.2306E 06 2.0670E 05 4.4940E 05
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                221        222        223        224        225        226        227        228        229        230
       CODE     4601       4602       4603       4604       4701       4702       4703       4704       4801       4802
DIRBTU
  1    700   0.0        1.1095E-03 2.2165E-03 1.3199E-03 1.7538E-03 0.0        1.0630E-04 1.3089E-03 0.0        2.2347E-03
  2    800   0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101   1.0679E-03 9.9070E-04 1.8288E-03 8.7053E-04 3.0145E-03 3.3176E-03 1.8410E-03 2.4153E-03 8.4650E-C4 9.4338E-04
  4   6801   7.1008E-04 6.9745E-04 8.8542E-04 8.6024E-04 1.1487E-03 9.9615E-04 1.2623E-03 1.0716E-03 7.4845E-04 1.0692E-03
  5   6802   0.0        1.4486E-03 1.5634E-03 1.2022E-03 1.2065E-03 0.0        5.4688E-04 4.9219E-03 1.0498E-03 9.7200E-04
INVBTU
  1    700   2.7662E-02 3.1570E-02 3.8378E-02 3.1268E-02 2.1558E-02 2.9172E-02 2.4862E-02 2.3623E-02 2.5204E-02 2.6583E-02
  2    800   2.9070E-02 3.0260E-02 3.4200E-02 3.0265E-02 2.4763E-02 2.9452E-02 2.5725E-02 3.1166E-02 2.6854E-02 2.6492E-02
  3   3101   1.4831E-02 1.3942E-02 1.6212E-02 1.4169E-02 1.2810E-02 1.5662E-02 1.2146E-02 1.3280E-02 1.2240E-02 1.2370E-02
  4   6801   4.3134E-03 4.2777E-03 4.7453E-03 4.5983E-03 3.8954E-03 4.1575E-03 4.4647E-03 4.2947E-03 4.0657E-03 4.3166E-03
  5   6802   1.5307E-02 1.7414E-02 1.9300E-02 1.7216E-02 1.2841E-02 1.4777E-02 1.4525E-02 1.8801E-02 1.5394E-02 1.4911E-02
TOINBU
  1    700   5.2252E-02 5.7289E-02 6.7649E-02 5.6756E-02 4.2274E-02 5.4305E-02 4.9950E-02 5.C328E-02 4.7835E-02 4.8591E-02
TCINBP
  1    700   5.9308E-02 6.4384E-02 7.5412E-02 6.4279E-02 4.8647E-02 6.1107E-02 5.3254E-02 5.7354E-02 5.4486E-02 5.5653E-02
PCGDOB
  1    700   3.5448E-06 8.5839E-04 3.2397E-04 9.9495E-04 1.4866E-03 8.6938E-04 9.7909E-04 1.1518E-03 1.0026E-03 8.9440E-04
  2    800   1.3588E-06 3.0012E-04 1.0531E-04 3.5128E-04 6.2286E-04 3.2016E-04 3.6954E-04 5.5430E-04 3.8967E-04 3.2514E-04
  3   3101   1.0737E-06 2.1418E-04 7.7321E-05 2.5472E-04 4.9906E-04 2.6370E-04 2.7024E-04 3.6584E-04 2.75C9E-04 2.3514E-04
  4   6801   2.2063E-C6 4.6428E-04 1.5990E-04 5.8405E-04 1.0722E-03 4.9457E-04 7.0182E-04 8.3588E-04 6.4561E-04 5.7973E-04
  5   6802   1.7748E-06 4.2840E-04 1.4741E-04 4.9564E-04 8.0115E-04 3.9845E-04 5.1753E-04 8.2941E-04 5.5408E-04 4.5391E-04
TOPCGU
  1    700   1.9107E-C6 4.4749E-04 1.6422E-04 5.1584E-04 8.2684E-04 4.6355E-04 5.1162E-04 6.9901E-04 5.4217E-04 4.6468E-04
TCPCGP
  1    700   5.0415E-05 4.8060E-04 2.0600E-04 5.5174E-04 8.6944E-04 4.9754E-04 5.6053E-04 7.3510E-04 5.8076E-04 5.0748E-04
PCGTOT
  1    700   0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2    800   0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101   0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4   6801   0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5   6802   0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GDOBTU
  1    700   0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GDODOL
  1    700   2.8330E 05 5.3020E 05 2.8740E 05 5.2830E 05 1.2241E 06 5.4720E 05 2.7188E 06 8.5410E 05 7.0020E 05 6.1430E 05
TFDOOL
  1    700   1.6000E 03 3.3950E 05 1.0540E 05 3.9730E 05 8.6100E 05 3.7210E 05 4.9170E 05 6.0880E 05 4.9670E 05 4.2010E 05
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                  231          232          233          234          235          236          237          238          239          240
   CODE           4803         4804         4805         4806         4901         4902         4903         4904         4905         4906
DIRBTU
 1   700        0.0          0.0          0.0          4.8277E-04   2.2334E-03   2.1236E-03   0.0          0.0          1.7713E-03   0.0
 2   800        0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
 3  3101        7.6931E-04   7.5634E-04   8.2960E-04   3.6653E-03   1.9974E-03   4.8205E-03   3.4747E-03   6.5087E-04   2.3039E-03   9.5761E-04
 4  6801        1.1350E-03   8.7630E-04   6.6507E-04   9.3227E-04   9.2033E-04   1.9860E-03   7.7477E-04   7.7345E-04   1.3755E-03   7.5228E-04
 5  6802        2.3165E-03   1.3813E-03   7.6982E-04   2.0648E-03   2.3642E-03   4.3913E-03   1.9467E-03   1.5999E-03   3.4898E-03   1.4299E-03
INV8TU
 1   700        2.6096E-02   2.8820E-02   1.6985E-02   2.8955E-02   2.5760E-02   4.1262E-02   2.8254E-02   1.7083E-02   2.9651E-02   2.6937E-02
 2   800        2.8405E-02   2.8914E-02   2.3142E-02   3.3378E-02   2.9876E-02   3.8091E-02   3.2269E-02   2.2470E-02   3.3892E-02   3.2554E-02
 3  3101        1.2310E-02   1.3333E-02   1.0758E-02   1.6490E-02   1.3619E-02   1.8217E-02   1.9625E-02   8.4724E-03   1.4653E-02   1.3707E-02
 4  6801        4.4954E-03   3.9891E-03   3.4935E-03   4.6015E-03   4.3850E-03   5.1389E-03   4.6912E-03   4.3054E-03   4.7485E-03   4.4378E-03
 5  6802        1.6869E-02   1.6264E-02   1.2822E-02   1.8060E-02   1.7210E-02   2.1452E-02   1.7998E-02   1.4713E-02   2.0245E-02   1.9156E-02
TCIN8U
 1   700        4.9831E-02   5.3590E-02   3.6498E-02   5.7552E-02   5.1080E-02   7.4015E-02   5.8650E-02   3.5080E-02   5.8610E-02   5.4882E-02
TCINBP
 1   700        5.7186E-02   6.0116E-02   4.2214E-02   6.5080E-02   5.8254E-02   8.2422E-02   6.3324E-02   4.2124E-02   6.6378E-02   6.2142E-02
PCGDOB
 1   700        4.2198E-04   7.6654E-04   5.1530E-04   1.9155E-03   1.6676E-03   2.5578E-04   2.8193E-04   1.2314E-06   1.8357E-04   4.7679E-04
 2   800        1.6754E-04   2.8052E-04   2.5610E-04   8.0543E-04   7.0548E-04   8.6131E-05   1.1746E-04   5.9079E-07   7.6536E-05   2.1018E-04
 3  3101        1.1246E-04   2.0036E-04   1.8439E-04   6.1631E-04   4.9813E-04   6.3799E-05   8.8094E-05   3.4503E-07   5.1253E-05   1.3707E-04
 4  6801        2.9016E-04   4.2352E-04   4.2306E-04   1.2151E-03   1.1331E-03   1.2716E-04   1.8687E-04   1.2388E-06   1.1739E-04   3.1354E-04
 5  6802        2.4680E-04   3.9140E-04   3.5196E-04   1.0810E-03   1.0080E-03   1.2032E-04   1.6219E-04   9.5593E-07   1.1340E-04   3.0742E-04
TOPCGU
 1   700        2.2883E-04   4.0881E-04   3.1336E-04   1.0882E-03   9.4166E-04   1.3201E-04   1.5830E-04   7.0335E-07   1.0364E-04   2.7749E-04
TOPCGP
 1   700        2.7504E-04   4.4319E-04   3.6141E-04   1.1083E-03   9.7416E-04   1.7497E-04   2.0377E-04   4.9279E-05   1.4965E-04   3.1916E-04
PCGTOT
 1   700        0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
 2   800        0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
 3  3101        0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
 4  6801        0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
 5  6802        0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0



GCOBTU
 1   700        0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
GCODOL
 1   700        3.0230E 05   4.5210E 05   4.7980E 05   1.2661E 06   1.5465E 06   1.0306E 06   3.6420E 05   1.7410E 05   1.0642E 06   3.0750E 05
TFDDOL
 1   700        2.0190E 05   3.3210E 05   3.7880E 05   8.2600E 05   8.0830E 05   7.7400E 04   1.2460E 05   9.0000E 02   7.7300E 04   2.2100E 05
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                       241        242        243        244        245        246        247        248        249        250
        CODE           4907       5000       5101       5102       5103       5104       5201       5202       5203       5204
DIRBTU
  1    700          0.0        4.1992E-04 9.0146E-04 0.0        0.0        1.7961E-03 2.1492E-03 1.9147E-03 0.0        0.0
  2    800          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101          2.0576E-03 2.0356E-C3 1.6318E-03 7.1265E-04 9.1954E-04 7.4183E-04 4.7032E-04 5.4705E-04 1.1227E-03 3.9901E-04
  4   6801          1.3817E-03 1.3085E-03 5.7995E-04 9.0249E-04 6.5794E-04 8.2095E-04 9.5428E-04 9.1917E-04 5.7676E-04 6.5671E-04
  5   6802          1.6329E-03 1.8795E-03 4.1643E-04 2.5919E-03 6.2811E-04 7.7584E-04 2.4383E-03 1.4667E-03 0.0        1.5171E-03
INVBTU
  1    700          2.6939E-02 2.4506E-02 1.0238E-02 1.2204E-02 2.3984E-02 2.4977E-02 3.0212E-02 3.1009E-02 2.8761E-02 2.6743E-02
  2    800          3.2311E-02 2.7880E-02 1.5689E-02 1.9904E-02 2.9633E-02 2.7650E-02 3.3043E-02 3.4610E-02 3.2150E-02 3.3343E-02
  3   3101          1.4271E-C2 1.2504E-02 8.7819E-03 8.6647E-03 1.3232E-02 1.2719E-02 1.4156E-02 1.5328E-02 1.5086E-02 1.4967E-02
  4   6801          5.4375E-03 4.9908E-03 2.5653E-03 3.0740E-03 4.3453E-03 4.4275E-03 5.0699E-03 5.2912E-03 5.1978E-03 5.1463E-03
  5   6802          1.9163E-02 1.6415E-02 7.5682E-03 1.1789E-02 1.6921E-02 1.5842E-02 1.9959E-02 2.0240E-02 1.8249E-02 1.9416E-02
TCINBU
  1    700          5.3601E-02 4.7202E-02 2.3263E-02 2.8915E-02 4.9103E-02 4.8028E-02 5.7988E-02 6.0123E-02 5.5512E-02 5.4740E-02
TCINBP
  1    700          6.2497E-02 5.5367E-02 2.7460E-02 3.3944E-02 5.6211E-02 5.5271E-02 6.6283E-02 6.8779E-02 6.4015E-02 6.3159E-02
PCGDOB
  1    700          1.6080E-03 2.1433E-04 1.6354E-03 2.8501E-04 1.5924E-04 5.0109E-04 4.2780E-04 2.7641E-04 2.6131E-03 2.4481E-04
  2    800          7.0351E-04 8.8943E-05 9.1614E-04 1.6956E-04 7.1766E-05 2.0235E-04 1.7067E-04 1.1254E-04 1.0655E-03 1.1134E-04
  3   3101          4.8126E-04 6.1785E-05 7.9251E-04 1.1433E-04 4.9636E-05 1.4417E-04 1.1329E-04 7.7197E-05 7.7438E-04 7.7407E-05
  4   6801          1.2956E-03 1.7423E-04 1.6356E-03 2.8656E-04 1.1516E-04 3.5457E-04 2.8656E-04 1.8827E-04 1.8850E-03 1.8805E-04
  5   6802          1.0350E-03 1.2989E-04 1.0938E-03 2.4910E-04 1.0165E-04 2.8756E-04 2.5570E-04 1.6324E-04 1.5001E-03 1.6081E-04
TOPCGU
  1    700          9.0216E-04 1.16C9E-04 1.0419E-03 1.8982E-04 9.2683E-05 2.7329E-04 2.3359E-04 1.5241E-04 1.4292E-03 1.4196E-04
TOPCGP
  1    700          9.5746E-04 1.6629E-04 1.1129E-03 2.4126E-04 1.4003E-04 3.1989E-04 2.7873E-04 1.9887E-04 1.4708E-03 1.8991E-04
PCGTOT
  1    700          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2    800          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4   6801          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5   6802          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GCOBTU
  1    700          0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GDODOL
  1    700          8.9040E C5 2.2573E 06 3.0820E 06 3.6240E 05 1.0360E 05 3.9920E 05 2.5530E 05 1.4510E 05 2.4248E 06 1.7280E 05
TFDDOL
  1    700          7.4530E C5 1.0920E 05 1.9944E 06 2.9160E 05 8.2900E 04 2.5050E 05 1.7680E 05 1.1130E 05 1.1344E 06 1.1430E 05
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                     251        252        253        254        255        256        257        258        259        260
        CODE         5205       5301       5302       5303       5304       5305       5306       5307       5308       5401
 OIRBTU
   1    700       2.2934E-04 0.0        3.9915E-03 3.8204E-04 1.7323E-03 0.0        8.0093E-04 5.7653E-03 0.0        2.8040E-03
   2    800       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
   3   3101       5.6088E-04 6.2646E-04 6.3845E-04 5.7213E-04 1.0520E-03 4.5354E-04 3.5141E-04 7.2891E-03 3.7388E-04 2.9804E-04
   4   6801       1.1808E-03 1.0296E-03 1.8398E-03 8.8789E-04 1.4290E-03 1.0434E-03 9.2708E-04 1.4094E-02 1.1408E-03 1.3701E-03
   5   6802       9.9775E-04 7.7873E-04 2.3434E-03 1.0356E-03 1.8109E-03 1.4393E-03 2.7838E-03 2.2196E-02 3.1830E-03 3.6763E-03
 INVBTU
   1    700       2.8841E-02 1.4772E-02 3.9107E-02 2.0686E-02 3.0639E-02 1.5555E-02 3.8753E-02 5.7425E-02 2.6297E-02 3.7133E-02
   2    800       3.3225E-02 2.1186E-02 3.8158E-02 2.5528E-02 3.1421E-02 2.0876E-02 3.6568E-02 8.6102E-02 3.8980E-02 3.7813E-02
   3   3101       1.4416E-02 9.9116E-03 1.6672E-02 1.1474E-02 1.4100E-02 9.3405E-03 1.5247E-02 2.7791E-02 1.3746E-02 1.4968E-02
   4   6801       5.4231E-03 3.9099E-03 6.3381E-03 4.3031E-03 5.5568E-03 3.7250E-03 5.3299E-03 2.0913E-02 8.7410E-03 5.9122E-03
   5   6802       1.9843E-02 1.1964E-02 2.2678E-02 1.4911E-02 1.8573E-02 1.2226E-02 2.2708E-02 5.9949E-02 2.6464E-02 2.4073E-02
 TCINBU
   1    700       5.6433E-02 3.1896E-02 7.0681E-02 4.1744E-02 5.6288E-02 3.2562E-02 6.9784E-02 1.2180E-01 5.6197E-02 6.8804E-02
 TCINBP
   1    700       6.5305E-02 3.8293E-02 8.1050E-02 4.8784E-02 6.5378E-02 3.8656E-02 7.8503E-02 1.5602E-01 7.0497E-02 7.8477E-02
 PCGDOB
   1    700       6.7287E-04 7.9643E-04 1.6882E-03 8.1644E-04 1.3330E-03 1.9085E-04 5.2949E-04 1.0302E-04 2.7506E-04 1.6110E-03
   2    800       2.8275E-04 4.1666E-04 6.0085E-04 3.6752E-04 5.0616E-04 9.3434E-05 1.8225E-04 5.6345E-05 1.4872E-04 5.9840E-04
   3   3101       1.9002E-04 3.0192E-04 4.0663E-04 2.5585E-04 3.5179E-04 6.4750E-05 1.1770E-04 2.8168E-05 8.1232E-05 3.6688E-04
   4   6801       5.0503E-04 8.4147E-04 1.0922E-03 6.7794E-04 9.7955E-04 1.8244E-04 2.9069E-04 1.4976E-04 3.6495E-04 1.0239E-03
   5   6802       4.1886E-04 5.8366E-04 8.8574E-04 5.3246E-04 7.4213E-04 1.3573E-04 2.8073E-04 9.7308E-05 2.5045E-04 9.4496E-04
 TOPCGU
   1    700       3.7250E-04 4.7839E-04 8.6678E-04 4.6408E-04 7.0212E-04 1.1173E-04 2.7314E-04 5.8863E-05 1.6004E-04 8.5000E-04
 TOPCGP
   1    700       4.2068E-04 5.4679E-04 9.0574E-04 5.1731E-04 7.5289E-04 1.6342E-04 3.1303E-04 1.1472E-04 2.2402E-04 8.8418E-04
 PCGTOT
   1    700       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
   2    800       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
   3   3101       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
   4   6801       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
   5   6802       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



 GCOBTU
   1    700       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
 GDODOL
   1    700       4.0520E 05 9.3850E 05 7.8170E 05 1.2061E 06 1.9876E 06 8.1910E 05 3.6180E 05 2.4420E 05 3.1950E 05 6.4570E 05
 TFDOOL
   1    700       2.9130E 05 6.7320E 05 5.3900E 05 4.9280E 05 5.5140E 05 1.5320E 05 1.7060E 05 2.2400E 04 1.3060E 05 5.4170E 05
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                    261        262        263        264        265        266        267        268        269        270
        CDOE        5402       5403       5404       5405       5406       5407       5501       5502       5503       5601
OIRBTU
  1   700      5.1732E-03 2.3661E-03 0.0        0.0        0.0        9.2715E-04 0.0        1.7025E-03 5.1415E-04 4.3340E-04
  2   800      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3  3101      7.6602E-04 2.5072E-04 3.3800E-04 2.8170E-04 5.1378E-04 2.7701E-04 3.4020E-04 2.2658E-03 2.3672E-03 2.0834E-04
  4  6801      1.5905E-03 1.1575E-03 8.5668E-04 9.6702E-04 1.2426E-03 8.3677E-04 1.1593E-03 9.8441E-04 4.9053E-04 4.5020E-04
  5  6802      2.7222E-03 3.7890E-03 1.6787E-03 1.8044E-03 0.0        4.0723E-03 3.3940E-03 2.1000E-03 1.2578E-03 0.0
INVBTU
  1   700      3.8604E-02 3.7281E-02 2.9977E-02 2.3774E-02 1.5116E-02 3.4652E-02 1.4155E-02 3.0134E-02 3.2784E-02 1.4416E-02
  2   800      3.8716E-02 3.8945E-02 4.0187E-02 2.9497E-02 2.0627E-02 3.8553E-02 2.7915E-02 4.2902E-02 3.8118E-02 2.1861E-02
  3  3101      1.6468E-02 1.5746E-02 1.7429E-02 1.3090E-02 1.0251E-02 1.5567E-02 9.8939E-03 1.8661E-02 1.7217E-02 1.1063E-02
  4  6801      6.3154E-03 6.2294E-03 6.5209E-03 4.9591E-03 3.5290E-03 5.4255E-03 4.2668E-03 6.0384E-03 5.6606E-03 3.4451E-03
  5  6802      2.3616E-02 2.4535E-02 2.4028E-02 1.7344E-02 1.0523E-02 2.4302E-02 1.8929E-02 2.5142E-02 2.2282E-02 1.1637E-02
TCINBU
  1   700      7.0760E-02 6.9755E-02 6.3390E-02 4.8119E-02 3.2077E-02 6.9569E-02 3.7678E-02 6.6764E-02 6.5022E-02 3.2699E-02
TCINBP
  1   700      8.1092E-02 7.9946E-02 7.4058E-02 5.6232E-02 3.7851E-02 7.8445E-02 4.4658E-02 7.6642E-02 7.4282E-02 3.8335E-02
PCGCOE
  1   700      2.7393E-03 2.1796E-03 1.5862E-03 3.4521E-04 1.1368E-04 5.4657E-04 3.5993E-04 6.7624E-04 1.4677E-04 2.5993E-03
  2   800      1.0021E-03 8.3056E-04 7.7568E-04 1.5623E-04 5.6585E-05 2.0972E-04 2.5819E-04 3.5119E-04 6.2250E-05 1.4378E-03
  3  3101      6.6023E-04 5.2011E-04 5.2105E-04 1.0739E-04 4.3553E-05 1.3116E-04 1.4174E-04 2.3660E-04 4.3549E-05 1.1270E-03
  4  6801      1.7888E-03 1.4538E-03 1.3774E-03 2.8743E-04 1.0594E-04 3.2296E-04 4.3186E-04 5.4090E-04 1.0116E-04 2.4795E-03
  5  6802      1.5162E-03 1.2979E-03 1.1504E-03 2.2786E-04 7.1604E-05 3.2790E-04 4.3427E-04 5.1049E-04 9.0258E-05 1.8985E-03
TOPCGU
  1   700      1.4268E-03 1.1588E-03 9.4496E-04 1.9681E-04 6.7650E-05 2.9689E-04 2.6736E-04 4.2542E-04 8.2833E-05 1.6583E-03
TOPCGP
  1   700      1.4586E-03 1.1939E-03 1.0027E-03 2.4734E-04 1.1763E-04 3.3677E-04 3.2296E-04 4.6977E-04 1.3013E-04 1.7296E-03
PCGTOT
  1   700      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2   800      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3  3101      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4  6801      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5  6802      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GCDBTU
  1   700      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GOODOL
  1   700      1.3390E 06 8.6990E 05 9.8320E 05 2.1570E 05 1.2770E 05 5.2880E 05 6.1780E 05 1.2432E 06 1.2378E 06 2.7870E 06
TFOODL
  1   700      8.8600E 05 7.3000E 05 6.6070E 05 1.8130E 05 9.3900E 04 1.8620E 05 3.1660E 05 2.8020E 05 5.5900E 04 2.2513E 06
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                   271        272        273        274        275        276        277        278        279        280
       CODE        5602       5603       5604       5701       5702       5703       5801       5802       5803       5804
DIRBTU
  1   700     0.0        3.0546E-03 1.5393E-04 0.0        4.2851E-04 4.1775E-04 5.3143E-04 2.4160E-03 0.0        2.1074E-03
  2   800     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3  3101     4.4244E-04 2.3746E-03 2.3544E-03 1.8478E-03 5.0634E-03 2.7582E-03 5.3572E-04 4.2173E-04 6.6411E-04 4.0039E-04
  4  6801     1.4891E-03 9.1356E-04 8.7627E-04 2.1727E-03 2.9270E-03 1.2485E-03 2.3683E-03 9.4535E-04 9.1647E-04 1.1132E-03
  5  6802     4.0875E-03 1.2939E-03 3.3505E-04 1.6903E-03 1.4028E-03 1.4009E-03 3.0237E-03 1.9201E-03 4.3703E-04 1.6758E-03
INVBTU
  1   700     2.2289E-02 1.7403E-02 1.2053E-02 1.6010E-02 2.2789E-02 2.0291E-02 2.4660E-02 1.7367E-02 1.3360E-02 2.5947E-02
  2   800     4.1460E-02 2.3088E-02 1.9099E-02 2.8995E-02 3.6267E-02 3.0852E-02 4.6416E-02 2.6214E-02 2.0179E-02 2.8334E-02
  3  3101     1.8371E-02 1.1732E-02 1.0349E-02 1.1149E-02 1.6971E-02 1.4850E-02 1.7387E-02 9.9632E-03 9.4539E-03 1.2284E-02
  4  6801     6.0063E-03 3.9023E-03 3.3754E-03 5.0242E-03 7.2559E-03 5.2454E-03 8.0493E-03 4.7157E-03 3.8595E-03 4.9360E-03
  5  6802     2.4255E-02 1.2335E-02 9.5343E-03 1.8874E-02 2.0796E-02 1.7192E-02 3.0591E-02 1.7117E-02 1.1376E-02 1.7106E-02
TCINBU
  1   700     5.7510E-02 3.6437E-02 2.7645E-02 3.9786E-02 5.1518E-02 4.5694E-02 6.2715E-02 3.8683E-02 2.9530E-02 4.9153E-02
TCINBP
  1   700     6.7336E-02 4.2821E-02 3.3167E-02 4.8005E-02 6.3389E-02 5.4276E-02 7.5884E-02 4.6398E-02 3.5844E-02 5.7228E-02
PCGOOB
  1   700     3.3936E-04 1.4818E-03 5.6248E-03 3.6107E-04 1.0184E-04 8.5709E-04 6.2431E-04 1.6135E-04 1.1780E-04 3.8070E-04
  2   800     2.3025E-04 7.1704E-04 3.2513E-03 2.3853E-04 5.9120E-05 4.7535E-04 4.2863E-04 8.8835E-05 6.4907E-05 1.5164E-04
  3  3101     1.5802E-04 5.6435E-04 2.7288E-03 1.4206E-04 4.2850E-05 3.5439E-04 2.4869E-04 5.2295E-05 4.7099E-05 1.0183E-04
  4  6801     3.6502E-04 1.3263E-03 6.2880E-03 4.5231E-04 1.2944E-04 8.8440E-04 8.1343E-04 1.7488E-04 1.3585E-04 2.8909E-04
  5  6802     3.3412E-04 9.5028E-04 4.0259E-03 3.8513E-04 8.4086E-05 6.5705E-04 7.0071E-04 1.4388E-04 9.0759E-05 2.2709E-04
TOPCGU
  1   700     2.4642E-04 8.7163E-04 3.5902E-03 2.4901E-04 6.3294E-05 5.3961E-04 4.4003E-04 1.0002E-04 7.2057E-05 2.0349E-04
TOPCGP
  1   700     2.9798E-04 9.3455E-04 3.7848E-03 3.0940E-04 1.1637E-04 6.0372E-04 5.1099E-04 1.5260E-04 1.2455E-04 2.5323E-04
PCGTOT
  1   700     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2   800     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3  3101     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4  6801     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5  6802     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GDOBTU
  1   700     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GCOOOL
  1   700     2.0790E 05 1.8165E 06 7.7385E 06 1.0317E 06 7.2000E 05 2.8539E 06 5.4800E 05 2.1270E 05 1.5460E 05 1.0953E 06
TFCOOL
  1   700     1.9010E 05 1.0631E 06 5.8271E 06 2.8160E 05 5.5800E 04 5.2740E 05 3.1610E 05 1.1600E 05 1.1010E 05 1.8320E 05
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                  281        282        283        284        285        286        287        288        289        290
        CODE      5805       5901       5902       5903       6001       6002       6003       6004       6101       6102
DIRBTU
  1     700    0.0        9.1085E-04 3.6455E-04 1.9642E-03 3.9134E-04 9.1189E-04 0.0        6.8656E-04 8.8627E-04 1.2463E-03
  2     800    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3    3101    5.0107E-04 2.3188E-03 3.0653E-03 6.5059E-04 1.2068E-03 2.7865E-03 7.8547E-04 1.3032E-03 4.0779E-03 1.5449E-03
  4    6801    1.0373E-03 9.7148E-04 6.0813E-04 8.1215E-04 9.8731E-04 1.5133E-03 1.6494E-03 1.3876E-03 1.7061E-03 6.9541E-04
  5    6802    1.6611E-03 2.0284E-03 9.4160E-04 1.1038E-03 1.2128E-03 7.2211E-04 0.0        0.0        1.0210E-03 1.1822E-03
INVBTU
  1     700    2.3175E-02 3.7769E-02 3.7367E-02 3.4299E-02 1.3205E-02 2.2135E-02 2.4501E-02 1.7707E-02 2.9591E-02 2.1794E-02
  2     800    3.4867E-02 4.0391E-02 4.2115E-02 3.2765E-02 2.0401E-02 2.8975E-02 2.9037E-02 2.2747E-02 3.0012E-02 3.4882E-02
  3    3101    1.5235E-02 1.8518E-02 1.9178E-02 1.5136E-02 9.8297E-03 1.4223E-02 1.2373E-02 1.0722E-02 1.5764E-02 1.6583E-02
  4    6801    6.1734E-03 6.0749E-03 7.4012E-03 4.9428E-03 4.0210E-03 5.5467E-03 6.4181E-03 5.1349E-03 4.8191E-03 5.7163E-03
  5    6802    2.0843E-02 2.3403E-02 2.4572E-02 1.8926E-02 1.1290E-02 1.5660E-02 1.7732E-02 1.2689E-02 1.5611E-02 1.9546E-02
TCINBU
  1     700    5.1629E-02 7.1850E-02 7.1793E-02 6.1929E-02 2.9429E-02 4.5348E-02 4.6871E-02 3.5120E-02 5.4597E-02 5.0738E-02
TCINBP
  1     700    6.1728E-02 8.1788E-02 8.3902E-02 7.0015E-02 3.6008E-02 5.4423E-02 5.7371E-02 4.3521E-02 6.2481E-02 6.0090E-02
PCGDOF
  1     700    1.2491E-04 9.1051E-04 1.5861E-03 6.4626E-02 4.6025E-03 5.0256E-03 1.5934E-04 2.7768E-03 3.1826E-03 5.6536E-04
  2     800    6.8552E-05 3.5518E-04 6.5208E-04 2.2519E-02 2.5937E-03 2.3997E-03 6.8881E-05 1.3012E-03 1.1774E-03 3.3007E-04
  3    3101    4.6396E-05 2.5221E-04 4.5992E-04 1.6112E-02 1.9356E-03 1.8245E-03 4.5460E-05 9.5001E-04 9.5789E-04 2.4304E-04
  4    6801    1.3282E-04 5.8457E-04 1.2540E-03 3.7176E-02 5.5941E-03 5.0270E-03 1.6661E-04 3.2144E-03 2.0689E-03 5.9192E-04
  5    6802    1.0165E-04 5.1045E-04 9.4371E-04 3.2264E-02 3.5603E-03 3.2170E-03 1.0434E-04 1.8004E-03 1.5191E-03 4.5877E-04
TCPCGU
  1     700    7.7563E-05 4.9364E-04 8.5839E-04 3.3354E-02 2.8275E-03 2.8647E-03 8.4009E-05 1.5088E-03 1.6696E-03 3.6848E-04
TCPCGP
  1     700    1.2895E-04 5.3278E-04 9.1561E-04 3.2523E-02 3.0587E-03 3.0309E-03 1.3803E-04 1.6790E-03 1.6960E-03 4.2640E-04
PCGTUT
  1     700    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2     800    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3    3101    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4    6801    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5    6802    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GDOBTU
  1     700    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GDODOL
  1     700    2.4940E 05 5.4150E 05 5.8990E 05 3.9067E 07 6.3469E 06 4.3638E 06 2.1000E 05 4.7509E 06 1.6868E 06 3.7310E 05
TFDDOL
  1     700    6.7300E 04 3.0100E 05 5.3000E 05 2.3526E 07 4.3518E 06 2.8349E 06 8.1200E 04 1.9581E 06 1.3429E 06 3.2390E 05
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                  291        292        293        294        295        296        297        298        299        300
        CODE      6103       6104       6105       6106       6107       6201       6202       6203       6204       6205
DIRBTU
  1    700     1.0029E-02 2.8739E-03 0.0        0.0        0.0        2.4148E-04 3.1080E-04 0.0        0.0        2.9208E-04
  2    800     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101     2.3392E-03 2.2563E-03 3.2672E-04 3.1214E-04 3.0695E-04 4.4655E-04 7.1402E-04 6.2115E-04 3.4112E-04 4.9483E-04
  4   6801     7.7944E-04 7.1334E-04 1.1452E-03 2.0310E-04 5.7885E-04 9.4319E-04 9.2958E-04 9.6687E-04 6.6694E-04 8.0432E-04
  5   6802     7.0978E-04 2.0733E-03 4.0526E-03 4.5596E-04 1.0945E-03 2.0866E-03 1.2090E-03 1.7036E-03 1.0474E-03 0.0
INVBTU
  1    700     3.0785E-02 6.1146E-02 2.5099E-02 2.7120E-02 4.5153E-02 1.5708E-02 1.8643E-02 1.7479E-02 2.8727E-02 1.9675E-02
  2    800     2.5457E-02 4.5867E-02 3.2339E-02 3.8558E-02 4.1928E-02 2.2992E-02 2.5314E-02 2.4774E-02 3.0439E-02 2.8169E-02
  3   3101     1.3522E-02 2.0924E-02 1.4458E-02 1.6038E-02 1.9901E-02 1.0476E-02 1.1491E-02 1.0919E-02 1.4759E-02 1.4009E-02
  4   6801     3.9394E-03 6.0211E-03 4.1787E-03 6.2817E-03 5.6428E-03 4.0282E-03 4.3295E-03 4.1433E-03 4.1275E-03 4.4183E-03
  5   6802     1.2939E-02 2.6917E-02 1.8879E-02 2.3766E-02 2.3707E-02 1.3274E-02 1.4496E-02 1.4625E-02 1.6966E-02 1.5168E-02
TGINBU
  1    700     5.2150E-02 1.0076E-01 5.3098E-02 5.9153E-02 8.1219E-02 3.4516E-02 3.9460E-02 3.7948E-02 5.4879E-02 4.3255E-02
TOINBP
  1    700     5.8595E-02 1.1061E-01 5.9934E-02 6.9430E-02 9.0451E-02 4.1106E-02 4.6543E-02 4.4727E-02 6.1631E-02 5.0483E-02
PCGOOB
  1    700     6.2724E-04 4.1842E-03 3.6525E-04 1.5046E-03 5.8077E-04 7.5206E-04 7.6178E-04 5.1935E-05 5.9728E-04 4.1459E-04
  2    800     1.8920E-04 1.1449E-03 1.7166E-04 7.8029E-04 1.9672E-04 4.3154E-04 3.7731E-04 2.6851E-05 2.3085E-04 2.1652E-04
  3   3101     1.5566E-04 8.0893E-04 1.1887E-04 5.0271E-04 1.4462E-04 2.8337E-04 2.6529E-04 1.8331E-05 1.7337E-04 1.6678E-04
  4   6801     3.2039E-04 1.6447E-03 2.4273E-04 1.3911E-03 2.8972E-04 7.6984E-04 7.0617E-04 4.9142E-05 3.4255E-04 3.7163E-04
  5   6802     2.3852E-04 1.6665E-03 2.4857E-04 1.1929E-03 2.7589E-04 5.7500E-04 5.4334E-04 3.9318E-05 3.1916E-04 2.8918E-04
TOPCGU
  1    700     3.0454E-04 1.9556E-03 2.2103E-04 9.2255E-04 3.0055E-04 4.6144E-04 4.5225E-04 3.1638E-05 3.2709E-04 2.5689E-04
TOPCGP
  1    700     3.4305E-04 1.9305E-03 2.6336E-04 9.8497E-04 3.3640E-04 5.2473E-04 5.1016E-04 8.0812E-05 3.6469E-04 3.0764E-04
PCGTOT
  1    700     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2    800     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4   6801     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5   6802     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GCOBTU
  1    700     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GCOOOL
  1    700     4.6950E 05 1.1869E 06 2.6430E 05 7.1390E 05 2.2720E 05 8.6460E 05 1.2790E 06 5.6100E 05 3.5000E 05 6.1650E 05
TFOOOL
  1    700     2.5440E 05 8.5440E 05 1.8170E 05 6.9270E 05 1.6060E 05 5.9780E 05 5.1020E 05 3.7100E 04 2.5960E 05 2.6310E 05
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                 301        302        303        304        305        306        307        308        309        310
      CODE       6206       6207       6301       6302       6303       6401       6402       6403       6404       6405
DIRBTU
  1    700    0.0        1.3554E-03 0.0        0.0        6.6050E-03 2.4503E-04 1.8982E-03 1.2872E-04 6.5626E-04 6.0075E-04
  2    800    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101    4.3652E-04 3.8527E-04 3.9325E-04 4.7757E-04 5.4196E-03 2.9780E-04 5.0662E-04 5.4068E-03 5.4711E-03 2.6992E-03
  4   6801    5.8060E-04 6.0826E-04 7.8674E-04 1.5019E-03 6.2993E-04 5.9928E-04 6.5817E-04 7.8138E-04 8.1603E-04 7.3908E-04
  5   6802    9.3370E-04 2.9576E-04 1.0821E-03 3.2013E-03 1.0119E-03 4.1131E-04 1.3683E-03 7.6238E-04 1.2577E-03 8.0585E-04
INVBTU
  1    700    2.5728E-02 1.5460E-02 1.4000E-02 2.2108E-02 2.5884E-02 1.5055E-02 1.8236E-02 2.4189E-02 2.1534E-02 2.3928E-02
  2    800    2.8539E-02 1.9777E-02 2.4337E-02 3.5319E-02 3.5762E-02 2.2891E-02 2.3670E-02 3.9905E-02 3.4716E-02 3.4202E-02
  3   3101    1.2124E-02 9.7780E-03 1.0124E-02 1.4416E-02 1.6913E-02 9.8446E-03 1.2268E-02 2.2375E-02 1.9700E-02 1.7675E-02
  4   6801    5.2748E-03 3.1748E-03 3.8043E-03 5.6954E-03 5.1667E-03 4.0955E-03 3.2753E-03 4.9511E-03 4.5239E-03 4.5822E-03
  5   6802    1.7524E-02 1.0569E-02 1.5097E-02 2.2206E-02 1.9737E-02 1.3745E-02 1.2318E-02 1.9318E-02 1.6547E-02 1.7658E-02
TCINBU
  1    700    4.8788E-02 3.1939E-02 3.4385E-02 5.1510E-02 5.6279E-02 3.3692E-02 3.8504E-02 5.8950E-02 5.1551E-02 5.3370E-02
TCINBP
  1    700    5.7417E-02 3.7133E-02 4.0609E-02 6.0828E-02 6.4731E-02 4.0392E-02 4.3862E-02 6.7050E-02 5.8952E-02 6.0867E-02
PCGCOB
  1    700    1.7989E-04 3.3741E-04 2.2347E-04 4.0830E-04 1.8597E-03 1.3502E-03 4.9731E-04 2.0490E-03 1.0346E-03 3.9651E-04
  2    800    7.2786E-05 1.5744E-04 1.4170E-04 2.3793E-04 9.3724E-04 7.4885E-04 2.3545E-04 1.2331E-03 6.0842E-04 2.0673E-04
  3   3101    4.7894E-05 1.2057E-04 9.1299E-05 1.5043E-04 6.8655E-04 4.9882E-04 1.8902E-04 1.0709E-03 5.3475E-04 1.6548E-04
  4   6801    1.4722E-04 2.7657E-04 2.4239E-04 4.1987E-04 1.4818E-03 1.4662E-03 3.5653E-04 1.6742E-03 8.6761E-04 3.0309E-04
  5   6802    1.1086E-04 2.0870E-04 2.1803E-04 3.7107E-04 1.2831E-03 1.1154E-03 3.0394E-04 1.4806E-03 7.1930E-04 2.6474E-04
TCPCGU
  1    700    9.5776E-05 1.9680E-04 1.5386E-04 2.6669E-04 1.1471E-03 8.4111E-04 2.9916E-04 1.4237E-03 7.0446E-04 2.5184E-04
TOPCGP
  1    700    1.4606E-04 2.4619E-04 2.0581E-04 3.2112E-04 1.1868E-03 9.2316E-04 3.4224E-04 1.4439E-03 7.4311E-04 2.9610E-04
PCGTOT
  1    700    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2    800    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3   3101    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4   6801    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5   6802    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GOOBTU
  1    700    0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GDODOL
  1    700    1.5790E 05 5.5700E 05 3.1590E 05 3.0800E 05 1.9359E 06 1.4396E 06 3.9370E 05 1.2002E 06 7.5060E 05 6.1740E 05
TFODOL
  1    700    8.7300E 04 2.7250E 05 1.9930E 05 2.3060E 05 8.9710E 05 1.1198E 06 3.4050E 05 1.0577E 06 5.9990E 05 2.0690E 05
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                 311          312          313          314          315          316          317          318          319          320
       CODE      6406         6407         6408         6409         6410         6411         6412         6501         6502         6503
OIRBTU
  1    700    0.0          0.0          3.1815E-04   1.1616E-02   2.1397E-03   0.0          1.3355E-03   3.8685E-03   0.0          0.0
  2    800    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  3   3101    1.9837E-04   3.4284E-04   6.2313E-04   5.6774E-04   7.8644E-04   5.8455E-03   9.6874E-03   5.1155E-02   5.3654E-02   6.1304E-02
  4   6801    8.6330E-04   1.1739E-03   8.6719E-04   2.1025E-03   5.6124E-04   6.8893E-04   8.0090E-04   6.2189E-04   6.3729E-04   5.1670E-04
  5   6802    0.0          8.2120E-04   6.5817E-04   1.5078E-03   1.2006E-03   1.7474E-03   8.1628E-04   1.7943E-03   8.2458E-04   1.2867E-03
INVBTU
  1    700    1.6142E-02   2.5264E-C2   2.2557E-02   3.9720E-02   2.4981E-02   3.1416E-02   2.1786E-02   1.0576E-02   1.0063E-02   4.5007E-03
  2    800    3.1619E-02   3.0430E-02   3.9302E-02   4.7586E-02   2.7036E-02   4.4970E-02   4.3501E-02   6.7869E-02   7.5059E-02   7.8561E-02
  3   3101    1.8002E-02   1.3402E-02   2.1100E-02   1.6416E-02   1.3984E-02   2.4207E-02   2.6427E-02   6.4417E-02   6.6936E-02   7.6798E-02
  4   6801    4.6157E-03   5.6111E-03   5.5838E-03   5.1934E-03   5.6123E-03   5.6369E-03   4.3750E-03   1.8075E-03   4.3847E-C3   1.6330E-03
  5   6802    1.5087E-02   1.8159E-02   1.9516E-02   3.2755E-02   1.4163E-02   2.2813E-02   1.7770E-02   8.9409E-03   1.2839E-02   8.1606E-03
TOINBU
  1    700    4.2966E-02   4.9869E-02   5.6266E-02   8.1881E-02   4.8265E-02   7.0530E-02   6.0742E-02   7.6567E-02   8.0567E-02   8.1366E-02
TOINBP
  1    700    5.0518E-02   5.9045E-02   6.5074E-02   9.0378E-02   5.4174E-02   7.9752E-02   6.7908E-02   7.9524E-02   8.7740E-02   8.4037E-02
PCGOOB
  1    700    5.4816E-05   1.7547E-04   1.8951E-04   4.2119E-04   1.2204E-05   4.4736E-04   5.1053E-04   2.7174E-03   2.1329E-03   1.3896E-03
  2    800    3.9166E-05   7.8853E-05   1.2044E-04   1.8395E-04   4.8180E-06   2.3359E-04   3.7185E-04   6.3410E-03   5.8032E-03   8.8476E-03
  3   3101    3.4537E-05   5.3788E-05   1.0015E-04   9.8345E-05   3.8599E-06   1.9475E-04   3.4987E-04   9.3513E-03   8.0157E-03   1.3396E-02
  4   6801    6.2565E-05   1.5911E-04   1.8055E-04   2.1982E-04   7.0445E-06   3.2041E-04   4.0925E-04   1.8539E-03   3.7098E-03   2.0125E-03
  5   6802    4.6355E-05   1.1672E-04   1.4835E-04   3.1407E-04   6.2603E-06   2.9393E-04   3.7677E-04   2.0784E-03   2.4622E-03   2.2796E-03
TOPCGU
  1    700    4.0985E-05   9.9182E-05   1.3378E-04   2.5074E-04   6.7611E-06   2.8707E-04   4.0888E-04   5.8218E-03   4.9591E-03   7.4499E-03
TOPCGP
  1    700    9.0229E-05   1.5023E-04   1.8211E-04   2.8639E-04   5.5078E-05   3.2809E-04   4.4174E-04   5.2286E-03   4.6854E-03   6.6393E-03
PCGTOT
  1    700    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  2    800    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  3   3101    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  4   6801    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  5   6802    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0



GDOBTU
  1    700    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
GDOOOL
  1    700    1.2890E C5   4.6150E 05   3.1110E 05   2.0710E 05   2.8850E 05   6.6930E 05   7.3690E 05   1.1143E 07   3.8402E 06   1.3486E 07
TFOOOL
  1    700    4.2400E 04   8.87C0E 04   1.0490E 05   1.3240E 05   6.1000E 03   1.7780E 05   2.9260E 05   3.2082E 06   2.6465E 06   3.8550E 06
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                   321          322          323          324          325          326          327          328          329          330
      CODE         6504         6505         6506         6507         6600         6700         6801         6802         6803         6901
DIR8TU
  1    700    3.4888E-C3 0.0          0.0          0.0          0.0          0.0          3.5587 E -01 1.0675E-03 5.6711E-03 0.0
  2    800    0.0          0.0          0.0          0.0          0.0          0.0          0.0          1. 18475E-00 0.0          0.0
  3   3101    1.1185E-01 1.2823E-01 4.8190E-04 2.2430E-02 5.4491E-03 1.4595E-03 3.5198 E -02 3.5096E-03 2.9126E-02 9.7139E-03
  4   6801    3.5660E-04 2.4103E-04 3.6300E-03 1.5697E-03 1.1938E-03 1.1174E-03 1.9676E-02 1.4208E-04 1.5541E-03 9.1206E-04
  5   6802    9.0114E-04 1.6921E-03 4.7223E-01 3.2014E-03 2.5025E-03 2.2899E-03 1.4390 E -01 7.2898E-02 1.1092E-02 2.0186E-03
INV8TU
  1    700    8.5267E-03 4.8690E-03 9.5070E-03 5.2606E-03 3.9993E-03 5.2478E-03 4.3659E-02 5.8159E-03 2.1762E-02 6.4574E-03
  2    800    1.2945E-01 1.4651E-01 4.7569E-01 3.1120E-02 1.4420E-02 1.4387E-02 3.9862E-02 1.5607E-01 9.0706E-02 2.5502E-02
  3   3101    1.3462E-01 1.4553E-01 7.5688E-03 2.6172E-02 9.3315E-03 7.5211E-03 1.6821E-02 1.3010E-02 4.6156E-02 1.7961E-02
  4   6801    1.4927E-03 1.6595E-03 4.7250E-03 2.4249E-03 1.7865E-03 2.3694E-03 2.2491E-02 1.6151E-03 7.0224E-03 2.1798E-03
  5   6802    7.7035E-03 1.2701E-02 4.8058E-01 7.4955E-03 5.8005E-03 7.4716E-03 2.3773E-02 1.2830E-01 4.8917E-02 8.6245E-03
TCIN8U
  1    700    1.3643E-01 1.4965E-01 4.8029E-01 3.3862E-02 1.6563E-02 1.7173E-02 6.0157E-02 1.6021E-01 1.0517E-01 2.9695E-02
TCIN8P
  1    700    1.3887E-01 1.5237E-01 4.8802E-01 3.7829E-02 1.9486E-02 2.1049E-02 9.6952E-02 1.6285E-01 1.1666E-C1 3.3261E-02
PCGDO8
  1    700    1.6531E-C3 8.5405E-04 2.1396E-04 4.7567E-05 2.1637E-03 1.8577E-05 2.47C6E-02 1.8590E-03 2.5378E-03 1.3315E-02
  2    800    9.1547E-03 9.3739E-03 3.9050E-03 1.0264E-04 2.8457E-03 1.8577E-05 8.2282E-03 1.8197E-02 3.8585E-03 1.9181E-02
  3   3101    1.4745E-02 1.4422E-02 9.6236E-05 1.3370E-04 2.8523E-03 1.5042E-05 5.3778E-03 2.3494E-03 3.0411E-03 2.0924E-02
  4   6801    1.1552E-03 1.1619E-03 4.2447E-04 8.7521E-05 3.8581E-03 3.3481E-05 5.0804E-02 2.0607E-03 3.2689E-03 1.7941E-02
  5   6802    1.3513E-03 2.0157E-03 9.7858E-03 6.1322E-05 2.8394E-03 2.3931E-05 1.2172E-02 3.7105E-02 5.1614E-03 1.6090E-02
TOPCGU
  1    700    7.8871E-03 7.8268E-03 3.2253E-03 8.7972E-05 2.5164E-03 1.6744E-05 7.9365E-03 1.5278E-02 3.5346E-03 1.7573E-02
TOPCGP
  1    700    6.9233E-03 6.8724E-03 2.8548E-03 1.3309E-04 2.6095E-03 6.6409E-05 1.2195E-02 1.3347E-02 3.4193E-03 1.6985E-02
PCGTOT
  1    700    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  2    800    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  3   3101    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  4   6801    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  5   6802    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0



GDOBTU
  1    700    0.0          0.0          0.0          0.0          0.0          0.0          3.1280E 06 1.3800E 07 0.0          0.0
GCODOL
  1    700    5.0339E 06 4.3688E 06 1.0265E 06 5.5720E 05 1.3495E 07 2.3080E 06 1.5427E 07 1.1302E 07 2.9467E 06 4.8440E 07
TFDDOL
  1    700    2.4207E 06 2.1901E 06 2.8100E 05 1.1290E 05 6.7552E 06 4.4200E 04 7.0657E 06 3.9910E 06 1.4561E 06 2.5746E 07
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                     331        332        333        334        335        336        337        338        339        340
        CODE         6902       7001       7002       7003       7004       7005       7101       7102       7201       7202
DIRBTU
  1   700       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2   800       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3  3101       9.4570E-03 2.5911E-03 9.6591E-03 3.5154E-03 2.5740E-03 3.1964E-03 0.0        8.0978E-04 9.5015E-03 9.3421E-03
  4  6801       2.2094E-03 1.4457E-03 3.1427E-03 1.3600E-03 1.6704E-03 1.4296E-03 0.0        3.5236E-04 1.6467E-03 9.7087E-04
  5  6802       5.1955E-03 3.4129E-03 7.4443E-03 3.2831E-03 3.9880E-03 3.3991E-03 0.0        1.2021E-03 8.5831E-03 2.3474E-03
INVBTU
  1   700       7.0719E-03 5.0932E-03 1.7009E-02 6.1150E-03 8.2063E-03 6.2483E-03 2.3096E-03 4.7528E-03 6.8113E-03 9.8920E-03
  2   800       2.3718E-02 1.2771E-02 4.5975E-02 1.8126E-02 2.1116E-02 1.7350E-02 7.0896E-03 1.5778E-02 3.1774E-02 2.8550E-02
  3  3101       1.3898E-02 5.9333E-03 2.4796E-02 9.8782E-03 1.0011E-02 9.0227E-03 4.7649E-03 8.6661E-03 1.7798E-02 1.8472E-02
  4  6801       3.2281E-03 2.2504E-03 6.7519E-03 2.7083E-03 3.5341E-03 2.6254E-03 6.3610E-04 1.5654E-03 2.9273E-03 2.9353E-03
  5  6802       1.0960E-02 7.3781E-03 2.3288E-02 9.0867E-03 1.1914E-02 8.9667E-03 2.6782E-03 7.2778E-03 1.5480E-02 1.1318E-02
TCINBU
  1   700       2.7437E-02 1.5527E-02 5.5970E-02 2.1428E-02 2.5651E-02 2.0871E-02 8.7384E-03 1.8904E-02 3.5545E-02 3.5393E-02
TCINBP
  1   700       3.2718E-02 1.9208E-02 6.7016E-02 2.5858E-02 3.1432E-02 2.5166E-02 9.7791E-03 2.1465E-02 4.0334E-02 4.0195E-02
PCGDDB
  1   700       3.5572E-02 2.3301E-03 2.2197E-03 8.4643E-04 5.3577E-03 0.0        7.1634E-03 6.6288E-03 1.4092E-03 5.7235E-03
  2   800       4.3518E-02 2.1312E-03 2.1885E-03 9.1519E-04 5.0286E-03 0.0        8.0208E-03 8.0267E-03 2.3979E-03 6.0257E-03
  3  3101       3.9496E-02 1.5336E-03 1.8282E-03 7.7251E-04 3.6928E-03 0.0        8.3497E-03 6.8287E-03 2.0804E-03 6.0383E-03
  4  6801       6.4814E-02 4.1095E-03 3.5171E-03 1.4964E-03 9.2101E-03 0.0        7.8752E-03 8.7149E-03 2.4174E-03 6.7793E-03
  5  6802       4.9878E-02 3.0540E-03 2.7497E-03 1.1380E-03 7.0377E-03 0.0        7.5157E-03 9.1838E-03 2.8977E-03 5.9250E-03
TCPCGU
  1   700       3.8513E-02 1.9475E-03 2.0344E-03 8.2305E-04 4.6130E-03 0.0        7.7813E-03 7.5224E-03 2.0987E-03 5.8423E-03
TCPCGP
  1   700       3.9851E-02 2.1489E-03 2.1609E-03 9.1088E-04 4.9684E-03 4.8547E-05 7.5406E-03 7.4074E-03 2.1001E-03 5.7649E-03
PCGTOT
  1   700       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  2   800       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  3  3101       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  4  6801       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
  5  6802       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0



GODBTU
  1   700       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
GODDOL
  1   700       7.2173E 07 1.0746E 07 2.1920E 06 2.9720E 06 1.3629E 07 4.3166E 06 3.8726E 07 4.5161E 07 3.7572E 06 8.7998E 06
TFDDOL
  1   700       6.2805E 07 5.7122E 06 1.6294E 06 1.7283E 06 8.1518E 06 0.0        3.8726E 07 1.7414E 07 2.5832E 06 7.2244E 06
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                       341         342         343         344         345         346         347         348         349         350
       CODE           7203        7301        7302        7303        7500        7601        7602        7701        7702        7703
DIRBTU
  1    700        0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  2    800        0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  3   3101        3.1441E-03  3.8154E-03  6.6051E-04  5.0092E-03  5.0159E-03  2.0808E-03  2.3260E-03  3.4609E-03  6.3314E-03  7.5652E-03
  4   6801        9.9622E-04  1.5542E-03  5.7134E-05  1.4543E-03  6.4600E-04  6.8656E-04  1.3659E-03  5.0405E-04  2.5474E-03  5.5727E-03
  5   6802        5.2708E-03  3.8857E-03  5.6828E-04  4.4764E-03  1.5251E-03  1.6759E-03  2.6452E-03  2.3645E-C3  4.9967E-03  1.1893E-02
INVBTU
  1    700        3.9852E-03  8.5683E-03  1.5135E-02  5.1841E-03  9.3985E-03  6.5632E-03  6.2334E-03  2.9081E-C3  9.5642E-03  1.5143E-02
  2    800        1.5005E-02  2.1613E-02  2.6770E-02  1.9919E-02  2.2795E-02  1.8747E-02  1.7793E-02  1.1862E-02  2.6401E-02  3.6529E-02
  3   3101        6.7201E-03  1.1282E-02  1.3451E-02  1.1405E-02  1.3537E-02  1.0829E-02  9.2068E-03  7.0317E-03  1.5159E-02  1.5901E-02
  4   6801        1.6709E-03  3.1575E-03  3.4066E-03  2.4291E-03  2.4469E-03  2.4270E-03  2.6046E-03  2.1905E-03  4.0327E-03  7.4054E-03
  5   6802        8.9070E-03  1.1206E-02  1.3993E-02  9.4358E-03  1.0050E-02  8.7180E-03  8.8673E-03  5.4222E-03  1.2604E-02  2.2219E-02
TCINBU
  1    700        1.7255E-C2  2.6902E-02  3.8366E-02  2.2580E-02  2.9652E-02  2.2789E-02  2.1321E-02  1.3533E-02  3.1776E-02  4.3979E-02
TCINBP
  1    700        1.9988E-C2  3.2067E-02  4.3939E-02  2.6554E-02  3.3655E-02  2.6759E-02  2.5582E-02  1.5481E-02  3.8374E-02  5.6094E-02
PCGDOB
  1    700        8.9221E-04  1.5833E-03  2.0594E-04  1.2655E-03  5.1282E-03  6.9538E-04  1.8781E-03  2.1037E-03  5.3874E-03  2.9903E-03
  2    800        1.2254E-03  1.8249E-03  1.3287E-04  1.7737E-03  4.5368E-03  7.2451E-04  1.9555E-03  3.1300E-03  5.4247E-03  2.6313E-03
  3   3101        8.5002E-04  1.4755E-03  1.0341E-04  1.5729E-03  4.1729E-03  6.4825E-04  1.5672E-03  2.8739E-03  4.8244E-03  1.7741E-03
  4   6801        1.4932E-03  2.9175E-03  1.8503E-04  2.3669E-03  5.3293E-03  1.0264E-03  3.1325E-03  3.4377E-03  9.C675E-03  5.8374E-03
  5   6802        1.8042E-03  2.3469E-03  1.7228E-04  2.0840E-03  4.9613E-03  8.3573E-04  2.4172E-03  3.5489E-03  6.4238E-03  3.9699E-03
TCPCGU
  1    700        1.0924E-03  1.7381E-03  1.4839E-04  1.5481E-03  4.6168E-03  6.7863E-04  1.7875E-03  2.7841E-03  4.9653E-03  2.3446E-03
TOPCGP
  1    700        1.1412E-03  1.8440E-03  1.95C9E-04  1.6234E-03  4.5629E-03  7.3772E-04  1.9090E-03  2.7944E-03  5.2551E-03  2.6709E-03
PCGTOT
  1    700        0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  2    800        0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  3   3101        0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  4   6801        0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
  5   6802        0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0



GDOBTU
  1    700        0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
GOODOL
  1    700        2.8128E 06  1.3373E 07  1.2699E 07  1.0943E 07  1.0866E 07  3.2013E 06  4.4957E 06  9.2282E 06  7.0478E 06  2.8711E 06
TFDDOL
  1    700        2.7954E C6  2.8902E 06  1.6990E 05  3.0479E 06  6.8128E 06  1.3229E 06  3.7619E 06  9.0324E 06  7.0332E 06  2.4657E 06
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                 351          352          353          354          355          356          357          358          359          360
      CODE       7704         77C5         7801         7802         7804         7901         7902         7903         8001         8002
OIR8TU
  1   700    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  2   800    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  3  3101    8.1719E-03   6.2831E-03   1.6280E-03   4.7699E-04   6.4763E-05   1.4234E-02   3.7846E-02   3.5520E-03   0.0          0.0
  4  6801    4.0240E-03   4.2392E-03   7.1503E-04   0.0          1.4727E-03   1.3339E-02   0.0          5.1142E-03   0.0          0.0
  5  6802    8,9860E-03   4.5348E-03   1.1158E-03   1.1304E-03   9.8032E-03   8.8090E-03   0.0          3.6478E-02   0.0          0.0
INVBTU
  1   700    1.2254E-C2   1.1528E-02   3.4483E-03   1.3635E-02   4.7830E-03   3.2000E-02   1.3153E-02   1.6778E-02   0.0          0.0
  2   800    3.4134E-02   2.4784E-02   1.9238E-02   2.0081E-02   1.7172E-02   4.6844E-02   5.5916E-02   6.9101E-02   0.0          0.0
  3  3101    1.7260E-02   1.3590E-02   1.6120E-02   1.4248E-02   3.5551E-03   2.3999E-02   4.8314E-02   1.9115E-02   0.0          0.0
  4  6801    5.7262E-03   5.7263E-03   1.2853E-03   2.7302E-03   2.2209E-03   1.5481E-02   5.1625E-03   7.3755E-03   0.0          0.0
  5  6802    1.8348E-C2   1.2303E-02   4.3717E-03   6.8512E-03   1.4086E-02   2.5236E-02   1.1365E-02   5.1691E-02   0.0          0.0
TCINBU
  1   700    4.0439E-02   3.0363E-02   2.1351E-02   3.0880E-02   1.9648E-02   6.2762E-02   6.37C6E-02   7.8217E-02   0.0          0.0
TCINBP
  1   700    4.9807E-02   3.9732E-02   2.3454E-C2   3.5346E-02   2.3281E-02   8.8089E-02   7.2152E-02   9.0284E-02   0.0          0.0
PCGOOB
  1   700    5.1876E-C3   7.0992E-03   3.3232E-C4   0.0          2.7696E-05   0.0          0.0          1.1528E-03   0.0          0.0
  2   800    5.2710E-03   5.5671E-03   6.7628E-04   0.0          3.6270E-05   0.0          0.0          1.7319E-03   0.0          0.0
  3  3101    4.1284E-03   4.7283E-03   8.7769E-04   0.0          1.1631E-05   0.0          0.0          7.4203E-04   0.0          0.0
  4  6801    9.6765E-03   1.4076E-02   4.9443E-04   0.0          5.1334E-05   0.0          0.0          2.0228E-03   0.0          0.0
  5  6802    7.0279E-03   6.8547E-03   3.8119E-04   0.0          7.3797E-05   0.0          0.0          3.2135E-03   0.0          0.0
TOPCGU
  1   700    4.7040E-03   4.9802E-03   5.9541E-04   0.0          3.1843E-05   0.0          0.0          1.5223E-03   0.0          0.0
TCPCGP
  1   700    5.0955E-03   5.7953E-C3   6.1042E-04   4.8547E-05   8.1218E-05   4.8547E-05   4.8547E-05   1.5650E-03   4.8547E-05   4.8547E-05
PCGTOT
  1   700    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  2   800    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  3  3101    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  4  6801    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
  5  6802    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0



GCO8TU
  1   700    0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0          0.0
GODDOL
  1   700    5.3551E C6   8.7088E 06   4.1412E 06   4.5780E 05   1.2651E 06   6.7500E 05   1.7330E 06   4.8280E 06   0.0          0.0
TFDOOL
  1   700    5.2859E 06   7.6890E 06   1.2033E 06   0.0          7.2300E 04   0.0          0.0          8.5790E 05-3.4773E 06-1.4318E 06
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                      361         362
      CODE           8100        8200
DIRBTU
  1    700         0.0         0.0
  2    800         0.0         0.0
  3   3101         0.0         0.0
  4   6801         0.0         0.0
  5   6802         0.0         0.0
INVBTU
  1    700         9.6138E-03 2.8814E-02
  2    800         6.3842E-02 4.1196E-02
  3   3101         5.5016E-02 1.9434E-02
  4   6801         2.8337E-03 5.2121E-03
  5   6802         1.3106E-02 2.2265E-02
TOINBU
  1    700         7.0512E-02 6.4595E-02
TCINBP
  1    700         7.5148E-02 7.3122E-02
PCGDOB
  1    700         0.0         8.8539E-04
  2    800         0.0         4.6383E-04
  3   3101         0.0         3.3891E-04
  4   6801         0.0         6.4218E-04
  5   6802         0.0         6.2180E-04
TOPCGU
  1    700         0.0         5.6962E-04
TOPCGP
  1    700         4.8547E-05 6.0391E-04
PCGTOT
  1    700         0.0         0.0
  2    800         0.0         0.0
  3   3101         0.0         0.0
  4   6801         0.0         0.0
  5   6802         0.0         0.0



GCOBTU
  1    700         0.0         0.0
GDOOOL
  1    700         7.7935E 06 2.1062E 06
TFDOOL
  1    700         0.0         3.8540E 05
```

Table 4.

The matrix $\underline{\underline{S}}$ accounts for energy to final demand. $\underline{\underline{S}}$ is actually 5 x 362, but entries in all but the energy sector-column are zero, so I adopt the shorthand of expressing it as 5 x 5.

$$\underline{\underline{S}} = \left(\begin{array}{llllll} 7.00 & 4.094 & 0 & 0 & 0 & 0 \\ 8.00 & 0 & 0 & 0 & 0 & 0 \\ 31.01 & 0 & 0 & 1.060 & 0 & 0 \\ 68.01 & 0 & 0 & 0 & 0.1435 & 0 \\ 65.02 & 0 & 0 & 0 & 0 & 0.9925 \end{array}\right) \times 10^6 \text{ Btu/\$(1963)}$$

(No output of crude and natural gas extraction is sold to final demand)

$$\underline{\underline{C}} = \begin{pmatrix} 1 & 0 & 0 & 1.754 & 0 \\ 0 & 1 & 0.896 & 0.843 & 0.970 \\ 0 & 0 & 1 & 0.173 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0.709 & 1 \end{pmatrix}$$

$$\underline{\underline{C}}\ \underline{\underline{S}} = \begin{pmatrix} 4.094 & 0 & 0 & 0.2517 & 0 \\ 0 & 0 & 0.9498 & 0.12097 & 0.9627 \\ 0 & 0 & 1.060 & 0.02483 & 0 \\ 0 & 0 & 0 & 0.1435 & 0 \\ 0 & 0 & 0 & 0.1017 & 0.9925 \end{pmatrix}$$

Now primary energy (which is used to produce secondary energy delivered to final demand) is also allocated to final demand. For example, \$1 FD for refined petroleum products results in 1.060×10^6 Btu being delivered to FD, and in 0.9498×10^6 Btu of crude oil and gas being allocated to FD. The latter is smaller because of a net importation of refined petroleum products in 1963.

Table 5. Breakdown total energy requirements by sectors. $(PCINVB)_{isj}$ is the fraction of total energy i demanded by $1 TFD(j) which is supplied to s. E.g., 65% of the coal required to deliver a car to final demand was used by the primary metals industries. $(TOTPCP)_{isj}$ is the corresponding fraction for primary energy, and $(TOTPCU)_{isj}$ for primary energy corrected for energy lost in electricity generation. Some sectors were omitted, so columns may add to less than unity. See Table 6 for definitions of the sectors.

(18.04) Apparel made from purchased materials

ROW	DESCRIPTION	PCINV8 COL 1	 COL 2	 COL 3	 COL 4	 COL 5	TOTPCU	TOTPCP
1	FOOD	0.02403766	0.05819343	0.10337794	0.03427364	0.01475514	0.05307137	0.05076722
2	CONSTRUCTION	0.00051482	0.00806491	0.01530776	0.00115607	0.00102906	0.00720063	0.00672473
3	TEXTILES	0.32246470	0.18720484	0.17498326	0.36393434	0.21070105	0.18886352	0.19197059
4	PAPER AND LUMBER	0.05961297	0.04392709	0.03549445	0.02830514	0.05521058	0.04634435	0.04425637
5	FURNITURE	0.00004977	0.00003809	0.00002686	0.00005741	0.00005194	0.00003728	0.00003722
6	CHEMICALS	0.36575532	0.27946651	0.18280542	0.25303650	0.38164270	0.28693998	0.27764720
7	RUBBER	0.00385064	0.00222231	0.00192922	0.00401557	0.00265458	0.00226974	0.00229035
8	LEATHER	0.00240198	0.00195073	0.00226452	0.00088760	0.00173877	0.00204910	0.00193578
9	STONE,CLAY,GLASS	0.00332654	0.00710142	0.00161983	0.00318717	0.01319243	0.00661685	0.00627882
10	PRIMARY METALS	0.05180266	0.02073919	0.01112732	0.02434834	0.03189899	0.02470296	0.02402274
11	FABRICATED METAL	0.00091333	0.00123489	0.00105755	0.00149694	0.00149015	0.00112804	0.00111497
12	MACHINERY	0.00208268	0.00147159	0.00129024	0.00224974	0.00174468	0.00146255	0.00146004
13	INSTRUMENTS	0.00128856	0.00094906	0.00076753	0.00172803	0.00119207	0.00091269	0.00092627
14	TRANSPORT. EQUIPMENT	0.00058167	0.00031891	0.00028141	0.00064349	0.00037622	0.00032492	0.00033108
15	TRANSPORT. SERVICES	0.00517489	0.10066992	0.17917055	0.00520271	0.02518285	0.09041911	0.08400792
16	MINING(METAL,STONE,FERT)	0.00486328	0.00937431	0.00405356	0.00626886	0.01543031	0.00864459	0.00830134
17	COAL MINING	0.00737753	0.00121606	0.00151986	0.00376453	0.00097155	0.00194072	0.00197380
18	CRUDE GAS	0.00133203	0.02452655	0.00159576	0.00299110	0.00595474	0.02190334	0.02043116
19	PETR.REFINING, ETC.	0.00322705	0.05243285	0.07011527	0.00555166	0.03715599	0.04695118	0.04375529
20	ELECTRIC UTILITIES	0.02696154	0.00845973	0.00314413	0.00054444	0.01445238	0.00696665	0.00928313
21	GAS UTILITIES	0.00046057	0.01689342	0.00146165	0.00019575	0.03386181	0.01516335	0.01405657
22	WATER	0.00099092	0.00294041	0.00410138	0.00072235	0.00190819	0.00272686	0.00255993
23	WHOLSALE & RETAIL TRADE	0.00900522	0.03774178	0.05687203	0.02022198	0.02011089	0.03355076	0.03202659
24	FINANCE INSUR & BUSINESS	0.00816594	0.01680208	0.01371900	0.01833733	0.02096979	0.01484403	0.01460848
25	MEDICAL	0.00005753	0.00009101	0.00006456	0.00012919	0.00012369	0.00008011	0.00008025
26	EDUCATION	0.00105857	0.00144951	0.00140547	0.00237711	0.00157904	0.00127273	0.00129014
27	ADVERTISING	0.00009845	0.00076403	0.00077871	0.00022108	0.00079314	0.00068105	0.00064126
28	RADIO,TV,COMMUNICATIONS	0.00182764	0.00418891	0.00487047	0.00400132	0.00372554	0.00371353	0.00362722

(54.02) Household refrigerators and freezers

ROW	OESCRIPTION	PCINVB					TOTPCU	TOTPCP
		COL 1	COL 2	COL 3	COL 4	COL 5		
1	FOOO	0.00231421	0.00503170	0.00879716	0.00260516	0.00283729	0.00486923	0.00473309
2	CONSTRJCTION	0.00024931	0.00640194	0.01584429	0.00086884	0.00061391	0.00611635	0.00588072
3	TEXTILES	0.00147144	0.00139427	0.00169892	0.00262833	0.00126191	0.00132255	0.00133722
4	PAPER ANO LUMBER	0.03954635	0.C3956627	0.04331825	0.02706983	0.03896591	0.03947876	0.03853487
5	FURNITURE	0.00004150	0.00004669	0.00004482	0.00007018	0.00005004	0.00004454	0.00004454
6	CHEMICALS	0.11142856	0.18718439	0.16725057	0.16377169	0.19169122	0.17994189	0.17672569
7	RUBBER	0.01482244	0.01613455	0.01832195	0.03195031	0.01546478	0.01508376	0.01530410
8	LEATHER	0.00007837	0.00009721	0.00014649	0.00004495	0.00006993	0.00009665	0.00009376
9	STONE,CLAY,GLASS	0.00807147	0.04293858	0.01213944	0.02246334	0.06474930	0.04073159	0.03961079
10	PRIMARY METALS	0.52726626	0.27300143	0.21053314	0.28841335	0.32576561	0.28555590	0.28121877
11	FABRICATEO METAL	0.00325898	0.00642443	0.00730503	0.00779483	0.00615190	0.00604050	0.00599430
12	MACHINERY	0.00332691	0.00523917	0.00684652	0.00717177	0.00444409	0.00493647	0.00492027
13	INSTRUMENTS	0.01271190	0.01560537	0.01606088	0.05281128	0.01602336	0.01439001	0.01466288
14	TRANSPORT. EQUIPMENT	0.00157631	0.00102139	0.00116936	0.00221923	0.00097285	0.00099044	0.00100817
15	TRANSPORT. SERVICES	0.00407437	0.09691834	0.22819829	0.00341661	0.01680961	0.09295779	0.08916718
16	MINING(METAL,STONE,FERT)	0.01421364	0.01757137	0.01496317	0.02298678	0.02031498	0.01681533	0.01672134
17	COAL MINING	0.00846904	0.00213209	0.00345914	0.00670670	0.00137479	0.00233509	0.00241654
18	CRUOE GAS	0.00071494	0.02010571	0.00169811	0.00249157	0.00393972	0.01921459	0.01846794
19	PETR.REFINING, ETC.	0.00154988	0.03884034	0.06790823	0.00412765	0.02190134	0.03716089	0.03569831
20	ELECTRIC UTILITIES	0.01614726	0.00773814	0.00373332	0.05627342	0.01066938	0.00605064	0.00730746
21	GAS UTILITIES	0.00042561	0.02384308	0.00267796	0.00028073	0.03857220	0.02287525	0.02191415
22	WATER	0.00064678	0.00293123	0.00530747	0.00073171	0.00153527	0.00282266	0.00272281
23	WHOLSALE & RETAIL TRAOE	0.00403803	0.02532993	0.04916930	0.01407259	0.01113718	0.02394149	0.02330607
24	FINANCE INSUR & BUSINESS	0.00349216	0.01096860	0.01183556	0.01217021	0.01091339	0.01021967	0.01011414
25	MEOICAL	0.00000842	0.00002122	0.00002092	0.00002936	0.00002239	0.00001963	0.00001959
26	EOUCATION	0.00043663	0.00089836	0.00112611	0.00152166	0.00079283	0.00082426	0.00083027
27	AOVERTISING	0.00010553	0.00125078	0.00165485	0.00036777	0.00104795	0.00119017	0.00114966
28	RADIO,TV,COMMUNICATIONS	0.00118109	0.00356243	0.00508474	0.00382020	0.00274530	0.00332830	0.00329008

(59.0[illegible]) Motor vehicles and parts

ROW	DESCRIPTION	PCINV8 COL 1	COL 2	COL 3	COL 4	COL 5	TOTPCU	TOTPCP
1	FOOD	0.00182209	0.00473944	0.00814805	0.00276412	0.00243944	0.00375934	0.00355243
2	CONSTRUCTION	0.00029032	0.00798706	0.01822392	0.00114857	0.00079247	0.00577839	0.00525714
3	TEXTILES	0.00605153	0.00561408	0.00573410	0.01323273	0.00578300	0.00465228	0.00503942
4	PAPER AND LUMBER	0.01606276	0.01770046	0.01642363	0.01309536	0.01945784	0.01692072	0.01603230
5	FURNITURE	0.00010644	0.00011134	0.00013816	0.00018412	0.00009664	0.00009659	0.00009869
6	CHEMICALS	0.06253487	0.12235790	0.10338336	0.10443318	0.12675792	0.09860235	0.09526873
7	RUBBER	0.01345425	0.01000244	0.00963317	0.01912288	0.01073449	0.00972520	0.00997474
8	LEATHER	0.00008995	0.00011713	0.00016253	0.00005856	0.00008899	0.00010956	0.00010209
9	STONE,CLAY,GLASS	0.00860091	0.03117183	0.00720984	0.01609363	0.05030763	0.02379638	0.02239468
10	PRIMARY METALS	0.65114659	0.34291571	0.24607819	0.34779626	0.43021917	0.43447876	0.41242307
11	FABRICATED METAL	0.00623930	0.01277688	0.01319797	0.01700672	0.01305296	0.00949337	0.00962812
12	MACHINERY	0.00870196	0.01394391	0.01589028	0.02324948	0.01314651	0.01047485	0.01091750
13	INSTRUMENTS	0.00685941	0.00842491	0.00651314	0.01861169	0.01022390	0.00635704	0.00692078
14	TRANSPORT. EQUIPMENT	0.15121984	0.11011714	0.08140337	0.25227779	0.13638180	0.10333025	0.10920006
15	TRANSPORT. SERVICES	0.00475569	0.11333966	0.24784762	0.00692079	0.01919273	0.08329719	0.07515156
16	MINING(METAL,STONE,FERT)	0.01454443	0.01704729	0.01459341	0.02341993	0.01964339	0.01473218	0.01474649
17	COAL MINING	0.00892688	0.00235943	0.00352480	0.00802499	0.00160661	0.00387799	0.00400368
18	CRUDE GAS	0.00068425	0.02020228	0.00157113	0.00270701	0.00418042	0.01462126	0.01328925
19	PETR.REFINING, ETC.	0.00182378	0.05388957	0.09637767	0.00498077	0.02498338	0.03925960	0.03553305
20	ELECTRIC UTILITIES	0.01519378	0.00764433	0.00339597	0.06010916	0.01113052	0.00389260	0.00743099
21	GAS UTILITIES	0.00039213	0.02306287	0.00238517	0.00029361	0.03940021	0.01687910	0.01515579
22	WATER	0.00053961	0.00256750	0.00428068	0.00069300	0.00142010	0.00197449	0.00181608
23	WHOLSALE & RETAIL TRADE	0.00384094	0.02491595	0.04427470	0.01519540	0.01176126	0.01770365	0.01687206
24	FINANCE INSUR & BUSINESS	0.00357606	0.01172556	0.01164225	0.01414749	0.01232606	0.00813723	0.00822455
25	MEDICAL	0.00000758	0.00002005	0.00001820	0.00003000	0.00002234	0.00001375	0.00001430
26	EDUCATION	0.00040120	0.00087188	0.00100791	0.00158721	0.00081143	0.00059021	0.00063332
27	ADVERTISING	0.00005375	0.00066879	0.00081476	0.00021263	0.00059173	0.00048062	0.00044494
28	RADIO,TV,COMMUNICATIONS	0.00111904	0.00316713	0.00435150	0.00389808	0.00243777	0.00224200	0.00226606

Table 6. Definitions of sectors used in Table 5.

TITLE	s	I/O Sectors Included (Listed by digits to left of decimal unless otherwise noted)
Food	1	01-04, 14, 15
Construction	2	11,12
Textiles	3	16, 17, 19
Paper, lumber	4	20, 21, 24, 25
Furniture	5	22, 23
Chemicals	6	27, 28, 30
Rubber	7	32
Leather	8	33
Stone, clay, glass	9	35, 36
Primary metals	10	37, 38
Fabr. metal	11	39, 40, 41, 42
Machinery	12	43-50
Instruments	13	51-53, 55, 57, 58, 62, 63
Transp. eqt.	14	59, 60, 61
Transp. Services	15	65, 75
Mining (metals, stone, fert.)	16	05, 06, 09, 10
Coal mining	17	07
Crude and gas	18	08
Pet. ref. and related	19	31
Elect. util.	20	68.01
Gas util.	21	68.02
Water	22	68.03
Wholesale and retail trade	23	69
Finance, ins., business	24	70, 71, 73.01, 73.03
Medical	25	77.01, 77.02, 77.03
Educational	26	77.04, 77.05
Advertising	27	73.02
Radio, TV, communications	28	56, 66, 67

Not used: 13 Ordnance
18 Apparel
29 Drugs
34 Footwear
54 Hshld appliances
65 Misc. manuf.
72 Hotels
64 R and D
76 Amusements
78 Fed. government enterprises
79 State and local government enterprises

Table 7

Inverse energy efficiency (I.E.E.) of the energy producing sectors; i.e., the total primary energy required to deliver 1 Btu of energy of various types to final demand, 1963. See Section V A.

I/O Sector	Title	I.E.E. (Btu/Btu)	I.E.E.(1) Corrected for imports	E.E.(2) (reciprocal)
7.00	Coal mining	1.024	1.024	0.977
31.01	Petroleum refining	1.082	1.208	0.828
68.01	Electric utilities	3.870	3.870	0.258
68.02	Gas utilities	1.134	1.169	0.855

(1) 10.4% of refined petroleum, 3.0% of gas were imported in 1963; the energy to produce them was expended outside the U. S. economy.(13)

(2) These results are based on producers' prices, so additional energy would be expended in delivering coal and refined petroleum to most consumers. For electric and gas utilities, sales go directly to final demand.

Table 8

Energy Cost to Supply Protein, 1963

I/O Sector	Title	T (primary)(1) (Kcal/$)	Producers Price(2) ($/lb.)	% Protein(3)	Protein Energy(4) (Kcal/lb.)	Energy/Calorie Content (5)
14.01	Meat Products	14,200	0.50	22	32,600	6
14.03	Cheese, natural and processed	15,600	0.30	25	18,800	3
14.06	Fluid milk	15,000	0.12	3.5	51,200	6
14.12	Fresh or frozen packaged fish	10,100	0.35	20	17,700	6

(1) 1 Kcal = 4.0 Btu

(2) Statistical Abstract of the United States, 1971 ed. Figures are approximate

(3) A. Bowes and C. Church, *Food Values of Portions Commonly Used*, 11th ed., Lippincott, Philadelphia (1970)

(4) Marketing energy not included; on the average it would increase figures by 10-15%

(5) Total calories including non-protein materials.

Table 9

Energy Impact of the Automobile, 1963 (a)

	Dollar Flow (10^9 \$)	I/O Sector	I/O Coefficient (b) (Btu/\$)	Energy 10^{12} Btu	% of Total
Gasoline					
production	5.86 (c)	31.01		5860	57.2
refining	-	31.01	(0.208 Btu/Btu) (d)	1220	11.9
retail markup (e)	4.05	69.02	32700	130	1.3
Oil					
production	0.83 (c)	31.01	-	50 (f)	0.5
retail markup	0.55 (g)	69.02	32700	20	0.2
Auto					
manufacture	14.43 (c)	59.03	70000	1010	9.9
retail markup	10.67 (c)	69.02	32700	350	3.4
Repairs, maintenance, parts	10.0 (c)	75.00	33700	340	3.3
Parking, garaging	11.7 (c)	75.00	33700	390	3.8
Tires					
manufacture	0.83 (c)	32.01	99100	80	0.8
retail markup	0.55 (g)	69.02	32700	20	0.2
Insurance	8.96 (c)	70.04	31400	280	2.7
Taxes (highway const.)	4.9 (e)	11.04	98500	490	4.8
Total	73.3 (12.4% of GNP)			10240 (20.5% of total)	100.0

a) The analysis is described in ref. 10. The numbers here differ somewhat since the calculation in ref. 10 was for 1970.

b) From ref. 1. These are expressed in total primary energy, including a thermal equivalent of hydropower. See Section IVB.

c) Figures obtained from ref. 14, pp. 306, 307, 322, and ref. 13, pp. 536-37. There were 69 x 10^6 autos registered in 1963, and 7.64 x 10^6 produced domestically at an average producer's price of \$1890. 0.41 x 10^6 were imported.

d) See table 7.

e) Retail gasoline markup and taxes from ref. 13, pages 458-59.

f) Oil/gasoline ratio = 128 on a Btu basis, from ref. 14, p. 537.

g) Markup of oil and tires assumed to be 40% of purchaser's price.

Table 10. Total Energy Impact of Transportation, 1963

Use	Energy (10^{15} Btu)	Percentage of total U. S. energy use(h)
Direct fuel (a)	11.5	23.1
Refining, etc. (b)	2.3	4.6
Highway construction (c, f)	0.57	1.1
Transportation eqt and maintenance (d, f)	2.33	4.7
Transportation services (e, f)	3.52	7.1
Other expenses associated with private auto: (g)		
Insurance	0.19	0.4
Accessories	0.06	0.1
Retail markup energy:		
Cars	0.26	0.5
Gasoline	0.11	0.2
		41.8(i)

(a) Bureau of Mines figure. See ref.13, p. 443.

(b) 20% of direct fuel. See Table 7.

(c) I/O Sector 11.04.

(d) Includes tires, maintenance, motor vehicles and parts, aircraft and parts, and other transportation equipment (I/O sectors 32.01, 75.00, 59.01-.03, 60.01-.04, 61.01-.07).

(e) Includes services such as air, water, rail, urban passenger and freight, pipeline transportation (I/O sectors 65.01-.07).

(f) Energy is obtained by multiplying total output (minus that sold to other transportation sectors), in dollars, times the appropriate energy coefficient from ref. 1 (diminished by the energy used by industry and commerce for transportation.)

(g) Various figures in ref.14. There were 8.05×10^6 cars sold in 1963 at an average markup of $1140; there were 69×10^6 cars on the road paying an average yearly insurance premium of $129; the average car owner bought $14 worth of accessories; 46×10^9 gallons of fuel were bought at a markup of approximately 9 cents per gallon. All these numbers were converted to energy using appropriate (diminished) I/O coefficients.

(h) U. S. energy use = 49.8×10^{15} Btu in 1963. Ref.13, p. 443.

(i) Since undoubtedly some additional transportation expenses have been omitted, this is a lower bound for transportation's total energy impact in 1963.

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